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ABSTRACT

This publication provides detailed information on widely available commercial vocational evaluation and assessment systems. An introduction considers two separate models for system selection--initial development of an evaluation unit and expansion of an existing unit. The Vocational Evaluation System Outline is described. A table compares 21 vocational evaluation systems. Descriptions of these assessment and vocational systems follow. Each description includes development, organization, physical aspects, vocational evaluation process, administration, scoring and norms, observation of clients, reporting, utility, training in the system, technical considerations, reviewer's summary and comments, address, cost, and references. Systems are Apticom, Career Evaluation System, Key Educational Vocational Assessment System, McCarron-Dial Evaluation System, Microcomputer Evaluation and Screening Assessment, Microcomputer Evaluation of Career Areas, Micro-TOWER, Philadelphia Jewish Employment and Vocational Service Work Sample System, Prep Work Samples, Pre-Vocational Readiness Battery, Skills Assessment Module, System for Assessment and Group Evaluation, Talent Assessment Program, TOWER System, Valpar Component Work Sample Series, Vocational Evaluation System by Singer, Vocational Information and Evaluation Work Samples, Vocational Interest Temperament and Aptitude System, Wide Range Employability Sample Test, Work Skills Development Package, and World of Work Inventory. (YLB)

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Karl F. Botterbusch, Ph.D.

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A Comparison**

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Preface

This publication will be the fifth MDC publication since 1976 offering an objective comparison of commercial vocational and assessment systems. Beginning in 1976 with A Comparison of Seven Vocational Evaluation Systems, continuing with A Comparison of Four Vocational Evaluation Systems in 1977, A Comparison of Commercial Vocational Evaluation Systems in 1980, and most recently the 1982 publication of A Comparison of Commercial Vocational Evaluation Systems (second edition), this series of publications has sought to provide vocational evaluators, special educators, vocational educators, manpower specialists, corrections personnel, and private rehabilitation practitioners with accurate and detailed information on widely available vocational evaluation and assessment systems.

Although it has only been four years since the 1982 Comparisons, the present publication reflects the significant changes that occurred in evaluation and assessment technology. Within the assessment industry there have been two major changes. First, the last four years have seen the development of six new systems (i.e., Apticom, KEVAS, MESA, MECA, SAM and WOWI), all of which are partially or entirely dependent on computers for either administration or scoring. Second, with the exception of the MECA, all of these systems are assessment systems, not evaluation systems.

The development of this new generation of instruments is the result of two forces. First, due mostly to reductions in rehabilitation funding, many state vocational rehabilitation agencies have reduced the amount of time allowed for vocational evaluation from two or three weeks to one week or less. In the past several years, evaluators have had to cope with the problem of obtaining accurate information about clients in ever shorter time periods. The new assessment systems relying on psychological testing and isolated trait work samples have offered one viable option. In addition, the strategy of many rehabilitation professionals, especially the ever increasing number in private practice, has changed from one of a lengthy vocational evaluation, usually followed by work adjustment and skill training prior to placement to one of direct placement after assessment or evaluation. This forces the evaluator to deal less with the client's ultimate potential and more with the direct transfer of skills and aptitude to currently available jobs.

The second force is the passing of the Carl Perkins Act (PL 94-142). This law mandates the assessment of all handicapped students in public schools. This single act has done more to expand the market for evaluation and assessment products than all other factors combined. It has also shifted the major market for evaluation products from vocational rehabilitation to education. All of the new work sample systems mentioned above were developed mainly for an education market, not vocational rehabilitation.

Based on changes within the evaluation industry and changes outside that industry, there are several recent trends that show no sign of weakening in the future. For both profit and non-profit rehabilitation programs, there will be the continued emphasis on assessment at the expense of vocational evaluation. If this continues, it is likely that the job sample and simulated work samples that have been the standard for over 15 years will be largely replaced by isolated trait work samples and psychometric instruments. This will continue until it is realized that many severely disabled persons cannot be evaluated in a few hours, resulting in a movement for additional

time, and more client or student involvement in the evaluation process. Then the cycle from long to short time periods will begin anew.

Another related trend has been the development and successful marketing of computerized job matching systems. Most of these systems require the entry of a client Worker Trait Profile, based on U.S. Department of Labor job analysis concepts, such as found in the Dictionary of Occupational Titles; this need for standardized traits may restrict or force many evaluation and assessment systems to initially plan or redesign the systems around the evaluation or assessment of DOL traits.

I would like to thank the commercial developers who have willingly provided manuals, technical reports, forms, and hardware for their respective systems. Finally, thanks to Darlene Botterbusch who designed the format, entered the text and edited this monograph.

Karl F. Botterbusch, Ph.D., CVE

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Some Considerations for Selecting Commercial Vocational Evaluation Systems

This short section considers two separate models for the selection of vocational evaluation or assessment systems. This first is the initial development of an evaluation unit; the second deals with the expansion of an existing unit.

Starting a New Evaluation Unit

Faced with the need to equip and administer a new vocational evaluation or assessment unit, many educators and evaluators believe that the purchase of a single commercial evaluation system will solve their problems. The evaluator should first analyze a number of factors before deciding how to equip the unit and then carefully investigate all the techniques (i.e., work samples, psychological testing, situational assessment, and job site evaluation) to determine the ones that provide him/her with the best methods of adequately assessing his/her clients. It is assumed that the main goal of most evaluations is to obtain accurate and useful data about a student or client in the shortest time period. The emphasis is on the word "accurate." Persons with no or slight disabilities may be accurately assessed using standardized psychological testing or one of the new assessment batteries (e.g., SAGE, CES, Apticom or MESA) in a few hours. Other more severely disabled persons may take several days or even weeks (e.g., JEVS, McCarron-Dial and VIEWS). Thus, while accuracy must be the main goal, it will take longer and will be more difficult to evaluate some students or clients than it will others.

A secondary goal is often to provide the client or student with specific vocational information, such as his/her interest in specific occupational areas, a realistic knowledge of his/her vocational strengths and weaknesses, specific vocational goals, and a plan for achieving these goals. Much of this information is provided through the honest and realistic sharing of results with the client, regardless of the evaluation tools used. It does imply, however, that the client has the opportunity to explore occupations. This can be provided through print and media programs, visits to training programs or industry, job site evaluation and work samples. The VES, Prep Work Samples and the new MECA are three work sample systems offering a wide variety of simulated work experiences. In summary, the two most common goals of any vocational evaluation unit are: (1) to accurately and quickly determine the client's abilities, capacities, etc. and (2) to provide the client with realistic information about him/herself.

These goals must then be related to the realistic work and/or training opportunities that exist beyond the evaluation unit. There are three considerations. The first consideration is the client population. Some evaluation units must be capable of serving clients with all types of mental, physical, psychological, and cultural disabilities. Other facilities and/or schools restrict themselves to serving either a single disability or a small number of disabilities. An evaluation unit dealing with many types of handicaps would generally need to have techniques covering the entire range of occupational areas and skill levels within these areas. A unit providing services to a single disability group can safely limit its evaluation areas. For example, a facility or school serving only mentally retarded clients could realistically avoid evaluation for occupations requiring large amounts of formalized training or higher education. Some work sample systems claim to have been designed specifically for a particular level of student or client functioning. When selecting evaluation tools, keep in mind the type of client(s) served; it would be a waste of time to assess a client for a job which

he/she could not fill because of his/her handicap. At present, most commercial vocational evaluation systems are designed for persons who can see and hear and who can understand written and/or spoken English; most contain no specific instructions or modifications for persons with significant hearing or sight losses. The evaluator should be aware that he/she will frequently have to modify commercial work samples so they meet the special needs of his/her clients (Botterbusch & Menz, 1986). In summary, if an evaluator is considering a commercial evaluation or assessment system, he/she should check the battery against the needs of the client population served and then decide: (1) whether the system is designed for the target disability group(s), or (2) whether other evaluation techniques would be more appropriate.

The second is the relationship between the community and the vocational evaluation unit. The teacher or evaluator must carefully investigate the range and type of jobs available in the local labor market. Thus, a small rural school or facility or a unit in a one industry community will have a more narrow range of job evaluation stations than either a urban facility or a secondary school with a large number of vocational training programs. Labor market information can be obtained through job surveys, local employment offices and agencies, and student placement records. Once potential employment opportunities have been determined, intelligent decisions can be made on what type of evaluation tools can best assess these demands.

The third consideration is training opportunities. Because the evaluation outcomes may not result in immediate placement, it is also necessary to investigate training opportunities. Even if the evaluation unit is located in a school, the evaluator needs to also consider training programs beyond a particular school or school system. The training options should be reflected in the selection of evaluation tools. A client's or student's range of occupations widens and his/her chances for upward mobility are frequently increased as a result of training. The presence of an area vocational-technical school, private trade and business schools, on-the-job training programs, apprenticeship programs, and higher education should be reflected in the evaluation unit. Vocational evaluation techniques covering a wide variety of occupational areas and assessing the full range of client/student aptitudes and interests are needed if the facility is in an area where many employment and training opportunities exist.

Based on the discussion above, the evaluator should take the following specific steps:

1. Decide on the goal(s) of the evaluation unit.

Example: Colfax High School has a large number of students that must be evaluated under the Carl Perkins Act. In addition to this special population, the school guidance counselor would like to use the evaluation unit for all students who need to set some specific vocational goals. From this description, an evaluation unit will have several goals: (1) to provide accurate assessment of aptitudes, abilities, and literacy for a special population; (2) to provide accurate assessment of aptitudes, abilities and literacy for a general student population; (3) to provide occupational information for all students commensurate with their abilities; and (4) to offer occupational experiences for all students to provide a basis for realistic self-knowledge.

2. What population(s) will be served?

Example: While many students included under the Carl Perkins Act are mentally retarded, there are a number of learning disabled, emotionally handicapped and some physically disabled students. There is a population of students who often lack specific or even general vocational goals; these students represent all ability levels. The populations to be included are: (1) mentally retarded, (2) general population students lacking direction, (3) learning disabled, and (4) physically and psychologically disabled students.

3. Determine what jobs exist within the community that are open to young adults upon graduation.

Example: Several methods were used. First, a mail survey was sent to 20% of the students graduating in the past three years. This survey asked about present and any prior jobs, how these were obtained, and what relationship they had to either general high school education or vocational courses. Second, the local Employment Service was asked to provide information of common entry level jobs and employers within the community. Third, vocational teachers offered data as to the employment of their former students. Fourth, informal contacts with employers yielded some information on hiring, training and retention practices.

4. Determine training opportunities both within the school system and out of the system.

Example: Colfax High School offers vocational training in the following areas: secretarial/clerical, power mechanics, vocational agriculture, wood-working, and distributive education. Present and past school records were used to track students into these programs. Information for vocational-technical training beyond the high school was obtained from the guidance counselor who provided the courses most commonly selected at the local voc-tech school: diesel mechanics, production welding, truck driving, data processes, medical technology, and accounting. Another guidance counselor offered information on the most commonly selected majors at the two state universities and three private colleges most commonly attended by Colfax graduates: elementary education, secondary education, business administration, engineering, psychology, applied mathematics, and industrial technology.

Using this publication as a beginning point, the newly hired evaluator checked the "9. Utility" section on the outline. She looked at "a. Vocational Exploration" and wrote down the systems that offered a wide variety of direct, hands-on experiences for the students. Under the "b. Vocational Recommendations" and "c. Counselor Utilization" sections she looked for systems that provided specific occupations as part of their recommendations. The systems selected on the basis of Utility were then compared on the rest of the outline.

The second step carefully reviewed section "11. Technical Considerations"; systems not having adequate norms, reliability, and, especially, validity were eliminated. The systems that remained at this point were compared to the remainder of the headings. These headings in the outline were first rank ordered in terms of their importance to the school. For example, time considerations, ease of administration, and methods of scoring were considered to be the most important.

It must be noted that if a school or other institution plans to establish a complete evaluation unit, they will most likely have to consider purchasing more than one commercial system. Because different systems are designed to meet different needs, it is unlikely that one system will solve all evaluation problems.

Changing an Existing Vocational Evaluation Unit

Like everything else in human services and education, vocational evaluation and assessment can change, often suddenly. With regard to vocational evaluation and assessment there are two major changes: (1) changes in type of client served and (2) changes in the community labor market. Evaluation unit equipment and procedures must be updated to reflect these changes. Often the unit finds that the composition of the clients served has changed. Some of these changes are anticipated, others are planned for, and yet others occur because of shifts in funding or program decisions beyond the control of the evaluation unit. When significant changes occur in the type of clients served, the evaluator must carefully review the work samples and other assessment techniques to determine the relevance of present evaluation procedures. For example, the decision to provide evaluation services to high school age students could result in an increase in the number and type of vocational exploration work samples used. A decision to serve industrially injured workers would place more emphasis on physical capacity assessment.

The second consideration is changes in the local job market and local training opportunities available to the clients. The evaluation unit is seen as part of the community and changing to accommodate the changing needs of that community. The following process is suggested as one means of keeping up with change:

First, carefully determine exactly what the changes are and the degree of their impact on the evaluation unit. For example, if the unit receives referrals from a new source or a sudden increase in numbers of a particular disability group, then the center needs to find out the reasons and adjust accordingly.

Second, the community should be carefully monitored for major shifts in the type of jobs available. Employment Service records, articles in the business section of local papers, personal contacts, and other sources should be used to determine changes. Some of these changes could be the opening of a new plant, the closing of a heavy manufacturing industry, an increase in new housing and other construction, the development of a new shopping mall, and expansion of an existing industry. These shifts should be carefully noted.

Third, the evaluation unit is changed to reflect current employment needs. The specific assessment tools used are changed. Thus, if the employment base of the community has changed from heavy manufacturing to light manufacturing and service, the evaluation unit should add more work samples in the business service areas. In short, the evaluation unit must reflect the labor and educational markets of the community.

Once the current labor and educational market are known, the evaluator needs to select work samples and other assessment devices that assess for and provide occupational information about these jobs. The traits measured by each individual work sample or system should be compared to the information gained about the community.

In conclusion, both newly established vocational evaluation units and older units must reflect the needs of the groups served as well as the job and training opportunities within the community.

Vocational Evaluation System Outline

1. Development

- a. Sponsor - The organization that originally developed the vocational evaluation or assessment system. Public funding sources, when applicable, are noted.
- b. Target Group - What specific populations, such as disadvantaged, mentally retarded or physically disabled, was the system designed to serve? The purpose or purposes of the vocational evaluation system (e.g., vocational assessment, occupation exploration) as seen by the developer and reviewer are included.
- c. Basis of the System - What theoretical or organizational principle, such as the Dictionary of Occupational Titles, was used as a basis for development.

2. Organization

- a. Name and Number of Work Samples - How many work samples does the system contain, and what are their names?
- b. Grouping of Work Samples - What is the arrangement of the individual work samples within the system? Are several work samples grouped in a hierarchy, classified according by DOT code, or is each work sample independent?
- c. Manual - What is the organization and contents of the manual(s)? Does it provide all the details that the evaluator needs to know in order to set-up, administer, score, and interpret the work samples?

3. Physical Aspects

- a. Packaging of the Work Samples - How are work samples packaged for sale and use? Is each work sample self-contained or must tools and equipment be shared with other work samples?
- b. Durability - How durable are the tools and equipment in the system? If the system uses audiovisual components, how prone to breakdown are they?
- c. Expendable Supplies - How much and what type of expendable supplies (e.g., wood, paper, cloth) are needed per client?
- d. Replacement - To what degree can supplies and materials (e.g., tools, nuts and bolts, colored chips) be obtained locally or must they be ordered from the developer? How does such replacement reflect on the standardization of the evaluation system?
- e. Computer Requirements - If the system requires the use of a computer for work sample administration and/or scoring, what are the computer system's requirements? What type of software is used?

4. Vocational Evaluation Process

- a. Preliminary Screening - What information is needed or what decisions must be made before a client can be administered the system? For example, does the student's reading level first need to be determined, is the system only intended for certain types of disability groups and what skills are needed prior to beginning testing?
- b. Sequence of Work Sample Administration - In what order, if any, are the work samples administered? Are they administered by increasing skill level? Are they administered by interest area? What is the usual order of administration? What variations are permitted? Do all work samples have to be administered?
- c. Client Involvement - To what extent is the client informed of his/her progress during the course of work sample administration? What type, if any, formal feedback is given to the student or client after the entire battery has been administered? What type of contact does the client have with the evaluator? Does the student or client play an active part in the evaluation process?
- d. Evaluation Setting - Does the general environment attempt to simulate competitive employment conditions, produce a classroom atmosphere, or resemble a formal testing situation?
- e. Time to Complete the Entire System - How many hours or days does it take the average person to complete all the work samples in the system?

5. Administration

- a. Procedures - Are the purposes of each work sample, materials needed, layout, timing, instructions to the client, etc. clearly given so that there is little chance of incorrect administration?
- b. Method of Instruction Giving - How does the student or client receive his/her instructions for the work samples in the system? For example: oral, demonstration, written instructions or computer? Does the work sample manual permit variations in administration procedures?
- c. Separation of Learning/Performance - Does the work sample have separate practice (i.e., learning) and performance (i.e., production) periods? Are there definite criteria (e.g., three consecutive correct assemblies; lines drawn within + or - 1/16 inch) that the student or client must reach before he/she can progress from a practice period to a performance phase?
- d. Providing Assistance to the Client - What procedures are there for giving extra or additional instructions, demonstrations or feedback after initial instructions? Can the evaluator or teacher offer advice or help during the performance phase of the work sample?
- e. Repeating Work Samples - What provisions are made for readministration of some work samples and what is the purpose of readministration? Are work samples repeated until the student or client reaches a predetermined level? Are readministrations plotted on a chart to produce a performance curve?

6. Scoring and Norms

- a. Timing - What are the procedures for timing the client?
- b. Timing Interval - At exactly what point does the evaluator start timing the student and when does he/she stop? Are there specific cut-offs or does the student or client continue until the work sample is completed?
- c. Time Norms - What is the procedure for reporting the time score for each work sample? Are norms given in percentiles, a rating, percent of industrial normal, etc.?
- d. Error Scoring - What procedures, such as a random check of some parts, general rating of overall quality or a comparison to standards, are used to determine errors?
- e. Scoring Aids - What use is made of overlays, templates, models, etc. to make error scoring more accurate and easier for the evaluator?
- f. Quality Norms - What procedures are used for reporting the number of errors, quality ratings, etc., for each work sample?
- g. Emphasis in Scoring - Does the system emphasize time or errors in the scoring process or are both given equal weight?

7. Observation of Clients

- a. Work Performance - Are work performance factors (e.g., fine finger dexterity, color perception) listed for the system in general and are specific work performance factors given for each work sample?
- b. Work Behaviors - Are work behaviors (e.g., ability to follow instructions, communication with supervisors) defined for the system and are specific work behaviors to be observed for each work sample?
- c. Recording System - What procedures does the system have for the recording, describing and rating of observed work performance and work behaviors?
- d. Frequency of Observation - How often (e.g., every five minutes) and to what extent is the evaluator or teacher to observe and record client behavior? What type of sampling, if any, is used, such as time sampling or event sampling?

8. Reporting

- a. Forms - What forms for recording time and quality, work performance, work behavior, etc. are used for each work sample in the system? What are the major content areas of these forms?
- b. Final Report Format - What information is included in the final report and what type of format (e.g., rating scales, free narration) is used to present this information? Is the final report format and/or an example report given in the work sample manual?

9. Utility

- a. Vocational Exploration - Does the system provide experiences that the client or student can readily relate to competitive employment?
- b. Vocational Recommendations - Are training and job recommendations specific or general? How are they related to the DOT or other job classification systems? Can additional evaluation, work adjustment, skill training, direct placement or other services be recommended as a result of using the system?
- c. Counselor Utilization - Can the system provide the counselor or referring agency with useful information either in the form of a final report and/or recommendations?

10. Training in the System

- a. Training Required - Is formal training required before the system is sold?
- b. Training Available - Is formal training available? Where is it available?
- c. Duration - How much time is required for training?
- d. Follow-up - Is technical assistance available after purchase and training?

11. Technical Considerations¹

- a. Norm Base - On what types of populations (e.g., client, employed, general working population) was the system normed, and are these norm groups clearly defined? Are norm groups of adequate size for practical use? Are predetermined time standards, such as Methods-Time-Measurement (MTM), used?
- b. Reliability - What empirical evidence is there to demonstrate that the system and its component work samples give reliable or consistent results? Are the research methods, sample sizes, sample characteristics and statistical procedures described in enough detail for the user to judge the meaningfulness of the results?
- c. Validity - What content, construct or empirical validity data are available to indicate that the system or individual work samples within the system really does what it claims, such as make more realistic vocational choices or predict job and/or training success? Are research methods, sample sizes, statistics etc. described in enough detail to permit the user to judge the usefulness of the system for his/her evaluation unit or school?

12. Reviewer's Summary and Comments

This contains what the reviewer considers to be the major advantages and disadvantages of the system. Also included are any unique points about each system and some ideas for its use.

¹ In general, this section relates each system to the Standards for Educational and Psychological Testing (American Educational Research Association, et al., 1985).

13. Address

The national home address of the company or institution selling the system.

14. Cost

The cost of the system at the time of publication and what materials and services are included in the price.

15. References

All generally available, non-promotional, references are given.

OUTLINE	APTICOM	CES
1. Development a. Sponsor b. Target Group c. Basis of System	JEVS disadvantaged students, special education, rehabilitation clients U.S. DOL Aptitudes	Rehabilitation Services Administration general population, disabled Data-People-Things
2. Organisation a. Number of Work Samples b. Grouping of Work Samples c. Manual	14 tests and work samples 10 Aptitudes, GED, Interests administration and technical manuals; very well-written	28 or less tests and apparatus tests 3 series of tests for different populations separate manual for each series; all system details
3. Physical Aspects a. Packaging b. Durability c. Expendable Supplies d. Replacement e. Computer Requirements	system self-contained fairly durable with careful use forms and printer paper from developer dedicated computer included; can be downloaded to IBM-PC	packaged separately for shipping fairly durable; needs recalibration forms and tests from developer optional IBM, Apple; modem; 128K; 2 disk drives
4. Vocational Evaluation Process a. Preliminary Screening b. Sequence of Work Sample Administration c. Client Involvement d. Evaluation Setting e. Time to Complete Entire System	not mentioned tests given in set sequence very little creates formal testing atmosphere 1 1/2 to 2 hours	not required any order very little creates formal testing atmosphere differs with series (3 1/2-4 hours)
5. Administration a. Procedures b. Method of Instruction Giving c. Separation of Learning/Performance d. Providing Assistance to Client e. Repeating Work Samples	specified in detail oral & demonstration; limited reading minimal not specified not repeated	specified in detail oral & demonstration; limited hearing clear separation no assistance after timing begins if invalid results suspected

KEVAS	McCarron-Dial	MESA
Key Education, Inc. handicapped & "normal" populations; students basic elements of psychophysical functioning	McCarron-Dial mentally retarded; mentally ill; learning disabled 5 neuro-psychological factors	Valpar middle 80% of population DOT Worker Trait Group
20 tests and apparatus tests 3 groups: psychophysical, attitudes, and work related competencies general manuals, contains most system details	6 basic measures; 5 optional 5 factors several manuals, contains all system details	84 separate pieces of information 9 major test categories general manual, contains all system details
system self-contained fairly durable forms and tests from developer no local computer needs	packaged into three kits fairly durable forms and answer sheets from developer optional IBM-PC, Apple, TRS-80	computer equipment used for several tests durable tests; computer equipment less durable forms and tests from developer Apple, IBM; 1 disk drive; printer; special equipment
not mentioned suggested order given in manual very little laboratory 2 1/2 to 3 hours	client interviewer factors 1 through 5 encouraged format testing and workshop 5 days with behavior observation	not required suggested sequence given in manual very little informal testing 4 hours
problems with format oral & demonstration; limited reading minimal careful monitoring on apparatus tests not specified	specified in detail oral & demonstration not applicable little assistance provided if invalid results suspected	specified in detail oral, demonstration, computer given minimal additional instructions provided permitted

OUTLINE	APTICOM	CES
6. Scoring and Norms a. Timing b. Timing Interval c. Time Norms d. Error Scoring e. Scoring Aids f. Quality Norms g. Emphasis in Scoring	preset times for each test after end of practice session no time norms used number of correct responses computer scored not relevant number of correct responses	evaluator times client, electrical devices varies with type of tests no separate time norms number of correct responses some use not relevant number of correct responses
7. Observation of Clients a. Work Performance b. Work Behaviors c. Recording System d. Frequency of Observation	no client observations made no client observations made no client observations made no client observations made	no factors observed limited information 5 point rating scale; people functions not relevant
8. Reporting a. Forms b. Final Report Format	3 profile sheets for hand scoring several options	standard data entry form single computer generated form
9. Utility a. Vocational Exploration b. Vocational Recommendations c. Counsel Utilization	very limited gives work group and job matches specific information given	very limited lists specific job titles dependent upon user
10. Training in the System a. Training Required b. Training Available c. Duration d. Follow-up	no yes - video tape not mentioned not mentioned	yes yes - audio cassette 12 hours available
11. Technical Considerations a. Norm Base b. Reliability c. Validity	selected samples; adequate size adequate data in manual most in .80's correlations with U.S. DOL tests	under development test-retest adequate very limited

KEVAS	McCarron-Dial	MESA
tests not timed	evaluator times client	computer timed
not relevant	specified time limits	several methods
no separate time norms	some separate time norms	no time norms used
number of correct responses	compared to standards	not used
not used	not used	not used
not relevant	combined with time norms to form single overall score	not used
number of correct responses	quality and quantity	number of correct responses
no factors observed	specific factors defined	specific work performance and work behaviors not used
limited information	specific factors defined	specific work performance and work behaviors not used
2 point rating scale	3 and 5 point scale	some tests scored through observation
not specified	2 hours for 5 days	constant
standard forms for all phases	standard forms for all phases	standard forms for all phases
several computer scored options	profile of results and recommendations	several options; computer generated
very limited	very limited	very limited
gives specific jobs & training programs	level of functioning	specific test results
notes impairments	oriented towards counselor	worker trait profile - compare to jobs
yes	yes	no
yes	yes	yes
2 days	3 days	2 days
yearly recertification required	advanced training recommended	advanced training available
3 national normative studies	extensive	MTM students & employed workers
several methods most in .80's	mostly test-retest .80's-.90's	test-retest .79-.96
two studies available	extensive as diagnostic instrument	mostly construct

OUTLINE	MECA	Micro-TOWER
1. Development a. Sponsor b. Target Group c. Basis of System	Conover Company special needs students work groups	ICD International Center f/t Disabled general rehabilitation population DOT and GATB
2. Organization a. Number of Work Samples b. Grouping of Work Samples c. Manual	15 each is independent separate manual for each work sample completed	13 5 aptitude areas general manual, separate manual for each work sample
3. Physical Aspects a. Packaging b. Durability c. Expendable Supplies d. Replacement e. Computer Requirements	each packaged separately durable electronics, paper, cleaning supplies, etc., forms from developer Apple; 1 disk drive	each packaged separately durable wire only forms locally duplicated not applicable
4. Vocational Evaluation Process a. Preliminary Screening b. Sequence of Work Sample Administration c. Client Involvement d. Evaluation Setting e. Time to Complete Entire System	not specified any order some classroom average 2 hours per work sample	not required discretion of evaluator extensive client involvement formal testing & counseling combination 15-20 hours
5. Administration a. Procedures b. Method of Instruction Giving c. Separation of Learning/Performance d. Providing Assistance to Client e. Repeating Work Samples	specified in detail computer and audio cassette none evaluator check points not specified	specified in detail audio cassette, evaluation demonstration stressed, almost total no assistance after timing begins not specified

JEVS	PREP	Valpar 17
U.S. Department of Labor disadvantaged, special needs DOT & GOE	PREP special needs, students, manpower Career Clusters & DOT	Valpar International mentally retarded not specified
28 12 work groups single manual contains all system details	27 each is independent general and separate manuals contain all details	11 assessment techniques using dif- ferent formats 5 areas general manual, separate manual for each, contains all details
each packaged separately very durable fabric, paper, metal, string most purchased locally not applicable	each packaged separately durable wood, circuit boards, food items, etc., forms purchased locally; forms from devel- oper not applicable	each of 5 areas packaged separately very durable no consumable materials forms locally duplicated or order from developer not applicable
not required progression from least to most com- plex some realistic work setting stressed 6-7 days	not required any order extensive client involvement classroom atmosphere average - 2 hours per work sample	one section given as screening any order considerable creates formal testing situation 5 1/2 hours
specified in detail oral & demonstration minimal assistance lowers scores not recommended	specified in detail audiovisual minimal little assistance after timing begins usually not readministered	specified in detail oral & demonstration, follow sample minimal not specified strongly recommended

OUTLINE	MECA	Micro-TOWER
6. Scoring and Norms a. Timing b. Timing Interval c. Time Norms d. Error Scoring e. Scoring Aids f. Quality Norms g. Emphasis in Scoring	evaluator times student separate times for each task rated on 5 point scale major & minor errors defined not used rated on 5 point scale time & quality given equal weight	cassette tape specified time for each work sample no time norms used number completed, pieces correct some use MODAPTS, rated on 5 point scale quality
7. Observation of Clients a. Work Performance b. Work Behaviors c. Recording System d. Frequency of Observation	12 factors two separate classes of behavior identified rated on 5 point scale not mentioned	no specific behaviors defined 5 work behaviors listed none frequent observations expected
8. Reporting a. Forms b. Final Report Format	standard forms for all phases optional computer generated report	standard forms for all phases 3 separate forms used to report different results
9. Utility a. Vocational Exploration b. Vocational Recommendations c. Counsel Utilization	extensive information given to client future educational goals designed for teacher/guidance counselor	some direct client use related to worker trait groups designed for counselor use
10. Training in the System a. Training Required b. Training Available c. Duration d. Follow-up	no yes 4-6 hours available	no yes 2 days available
11. Technical Considerations a. Norm Base b. Reliability c. Validity	no data available no data available no data available	19 different norm groups adequate data in manuals .74-.97 construct and concurrent reported

JEVS	PREP	Valpar 17
client uses time clock from end of instructions to task completion rated on 3 point scale random check, compared to standards minimal use most rated on 3 point scale time and quality given equal weight	not relevant entire work sample no separate time norms compared to standards some use ratings based on industrial standards quality	only one time score used in system preset for one task used only for one task number of correct responses not used number of total points number of correct responses
16 specific; 4 general factors specified clearly defined 3 point rating scale extensive observation	no factors listed 8 behaviors defined 3 point rating system not specified	no factors listed some specific areas defined 3 point rating scale not specified
standard forms for all phases narrative summary; standardized format	standard forms for all phases narrative summary with work sample results	standard forms for recording & scoring not used; depends upon facility
limited highly related to DOT oriented toward counselor	extensive information given to client specific jobs & training related to DOT report aimed at counselor & client	some direct client use largely dependent upon user results of each task designed for counselor usage
yes yes 1 week not available	no yes 1 day as requested by user	no yes 1 day or more as requested by user
1,100 clients no data available no recent data are available	industrial quality standards no data available content validation only	"research norms" no data available no data available

OUTLINE	SAM	SAGE
1. Development a. Sponsor b. Target Group c. Basis of System	Piney Mountain Press mildly handicapped, disadvantaged students D-Map, GOE, GATB	Train-Ease Corp students; disadvantaged; some disabled DOT, GOE
2. Organisation a. Number of Work Samples b. Grouping of Work Samples c. Manual	3 tests, 12 work samples each is independent general manual, many details lacking	15 tests, work samples & inventories worker trait group variables separate section of manual for each test; contains all details
3. Physical Aspects a. Packaging b. Durability c. Expendable Supplies d. Replacement e. Computer Requirements	packaged into 1 kit fairly durable tests and forms from developer Apple, IBM, 1 disk drive, printer	each packaged separately appears durable no consumables except forms from distributor IBM, 2 disk drives, 640K RAM
4. Vocational Evaluation Process a. Preliminary Screening b. Sequence of Work Sample Administration c. Client Involvement d. Evaluation Setting e. Time to Complete Entire System	not required tests given first, work samples in any order some classroom atmosphere 1 1/2 to 2 1/2 hours	not required any order little during testing formal testing 4 hours
5. Administration a. Procedures b. Method of Instruction Giving c. Separation of Learning/Performance d. Providing Assistance to Client e. Repeating Work Samples	lacks details oral & demonstration clear separation no assistance during performance phase encouraged	specified in detail oral or self-administered clear separation no assistance after timing begins if invalid results suspected

TAP	TOWER	Valpar
Talent Assessment Program above TMR students disadvantaged "functional aptitudes"	Vocational Rehabilitation Administration physically and emotionally disabled job analysis of possible jobs for disabled	Valpar International general population, injured workers trait-and-factor
10 each is independent general manual contains all system details	93 14 training manuals single manual; some details not provided	19 each is independent separate manual for each work sample; contains most details
each packaged separately very durable forms and printer paper locally or from developer Apple, TRS-80, IBM, 1 disk drive, printer	ICD does not sell hardware, each user constructs own; this section not relevant for TOWER not applicable	each packaged separately very durable few expendable supplies; forms locally or from developer not applicable
not mentioned first and last test specified; rest any order little during testing formal testing 2 to 2 1/2 hours	emphasized for planning purposes progressive within 14 areas not specified realistic work setting stressed 3 weeks	not required discretion of evaluator minimal classroom or work place estimate 1 hour per work sample
specified in detail wide variety of methods used considerable separation assistance can be provided after timing begins if desired by client	some specified in detail written and demonstration not specified not specified encouraged for upgrading	specified in detail oral and demonstration; limited reading 11 work samples have formal practice periods not specified evaluator's decision

OUTLINE	SAM	SAGE
6. Scoring and Norms		
a. Timing	evaluator times client	electric and electronic timing devices
b. Timing Interval	from end of practice for specified time period	specified period of time for each task
c. Time Norms	percentiles MTM	converted to 5 or 6 point scales
d. Error Scoring	not clearly defined	not relevant; errors not recorded
e. Scoring Aids	some use	extensive use
f. Quality Norms	percentiles	not relevant; no errors recorded
g. Emphasis in Scoring	time & quality given equal weight	only number of correct responses are recorded
7. Observation of Clients		
a. Work Performance	no factors listed	no factors listed
b. Work Behaviors	8 behaviors defined	19 separate behaviors defined
c. Recording System	5 point rating scale	4 point rating scale
d. Frequency of Observation	constant	not specified
8. Reporting		
a. Forms	one form for data entry	standard forms for all phases
b. Final Report Format	profile related to training programs; computerized	worker trait profile results
9. Utility		
a. Vocational Exploration	very limited	very limited
b. Vocational Recommendations	training programs within school	lists DOT titles and codes
c. Counsel Utilization	report aimed at counselor and student	dependent upon user
10. Training in the System		
a. Training Required	no	no
b. Training Available	yes	yes
c. Duration	2 hrs to 1 day	1 day
d. Follow-up	technical assistance available	available
11. Technical Considerations		
a. Norm Base	MTM 3 student norm groups	4 different norm groups
b. Reliability	test-retest over .80	test-retest; KR-20 reasonably high
c. Validity	no data available	other tests and ratings acceptable levels

TAP	TOWER	Valpar
evaluator times client from end of instructions to task completion percentiles	evaluator times client from end of instructions to task completion rated on 5 point scale	evaluator times client from end of instructions to task completion actual time recorded; converted to MTM and percentiles
penalty times added to time scores not used no separate quality scores time	compared to standards extensive use rated on 5 point scale time & quality given equal weight	scored separately and combined with time score some use separate norms, percentiles MTM standards
no factors defined; some listed no factors defined; some listed not used not specified	only one factor defined a few listed in final report 5 point rating scale not specified	no factors defined 17 work characteristics defined 5 point rating scale not specified
standard form computer generated format; profiles; scores	standard form for each phase narrative report using standard outline and rating	separate form for each work sample none used, independent work samples
very limited specific job titles listed oriented toward counselor	direct client use - exposure to several areas limited to jobs related to work areas oriented toward counselor	limited depends on use in facility cannot be specified
yes yes 1 1/2 days as needed	yes yes 1 and 2 week classes not available	no yes depends on evaluator needs consultation basis
7 different norm groups coefficient of stability .85 no data available	clients no data available equivocal results	MTM; 11 norm groups data available cannot be assessed no data available

OUTLINE	VES	VIEWS
1. Development a. Sponsor b. Target Group c. Basis of System	Singer Educational Division special needs population groups of tasks on related jobs	JEVS moderately & severely mentally retarded DOT - worker skill groups
2. Organisation a. Number of Work Samples b. Grouping of Work Samples c. Manual	28 each is independent 4 basic manuals, detailed	16 4 worker skill groups single manual; very detailed
3. Physical Aspects a. Packaging b. Durability c. Expendable Supplies d. Replacement e. Computer Requirements	each self-contained in carrel expect some problems wood, metal, wire, chemicals, forms locally or from developer not applicable	most individually in portable plastic cabinets very durable paper, string, fiberboard, forms from developer not applicable
4. Vocational Evaluation Process a. Preliminary Screening b. Sequence of Work Sample Administration c. Client Involvement d. Evaluation Setting e. Time to Complete Entire System	not required discretion of evaluator considerable client involvement classroom atmosphere average 2 1/2 per work sample	not required from least to most complex extensive client involvement realistic work atmosphere stressed 20 to 35 hours
5. Administration a. Procedures b. Method of Instruction Giving c. Separation of Learning/Performance d. Providing Assistance to Client e. Repeating Work Samples	specified in detail audio-visual minimal checkpoints bulletin at request of client	specified in detail oral & modeling, flexibility in technique stressed Almost total; well established criteria little assistance after timing begins repeated if considered necessary

VITAS	WREST	WSD
Manpower Administration educationally & culturally disadvantaged GOE	Jastak Associates severely disabled-mentally & physically not specified	Attainment Company severely mentally retarded, mentally ill, & physically disabled 3 basic prevocational skills
21 16 GOE Work Groups single manual very detailed	10 each work sample is independent well-organized manual; contains all details	20 function and difficulty single manual; most system details given
each packaged separately durable paper, string, sheet metal, forms from developer not applicable	system packaged in cardboard cartons durable mostly paper products, forms from developer not applicable	each work sample packaged individually durable plastic bags and forms extras provided, also order from developer not applicable
not required progressive from least to most complex considerable client involvement realistic work setting stressed 15 hours	not required discretion of evaluator some formal testing 1 1/2 hours	not specified by difficulty of task not specified classroom or work activity center not relevant - training stressed
specified in detail oral and demonstration no separation little assistance provided not recommended	specified in detail oral and demonstration considerable no assistance after timing begins encouraged for upgrading	specified in detail modeling and oral flexibility urged minimal discretion of evaluator repeated for upgrading

OUTLINE	VES	VIEWS
6. Scoring and Norms a. Timing b. Timing Interval c. Time Norms d. Error Scoring e. Scoring Aids f. Quality Norms g. Emphasis in Scoring	evaluator times client varies with each work sample based on number of minutes to completion compared to criteria some use 5 point scale or subtracted from time score time & quality given equal weight	evaluator times client after task is learned to completion rated on 3 point scale; MODAPTS compared to standards some use rated on 3 point scale time & quality given equal weight
7. Observation of Clients a. Work Performance b. Work Behaviors c. Recording System d. Frequency of Observation	20 factors defined none listed not used-actual observation recorded not specified	10 factors defined clearly defined specific behaviors recorded constant
8. Reporting a. Forms b. Final Report Format	standard form for all phases no format given; includes description of contents	standard forms for all phases standard format with behavior data & work group
9. Utility a. Vocational Exploration b. Vocational Recommendations c. Counsel Utilization	extensive information given to client dependent upon user dependent on user	little use to client related to DOT & Worker Skill Groups oriented toward counselor
10. Training in the System a. Training Required b. Training Available c. Duration d. Follow-up	no yes 2 day, 1 or 2 weeks available available	yes yes 1 week not available
11. Technical Considerations a. Norm Base b. Reliability c. Validity	clients, employed workers, MTM test-retest .61 or .71 mostly content	452 mentally retarded persons, MODAPTS no data available no data available

VITAS	WREST	WSD
evaluator times client from end of instructions to completion rated on 3 point scale compared to standards extensive use rated on 3 point scale time & quality given equal weight	evaluator times client from end of instructions for specified period of time time to completion compared to scale scores compared to standards not used all errors totaled for a single quality score time	exact procedures not specified not specified some MTM norms compared to standards not used percentage of the errors recorded time & accuracy given equal weight
9 factors defined several general factors defined specific behaviors reported almost constant observation stressed	no factors defined 10 defined in general terms scale from 1 to 18 not specified	separate rating form mostly on-task off-task interval & event recording used carefully specified
standard forms for all phases standard format, emphasis on work group	standard forms for recording performance numerous examples given in manual	standard forms for recording performance not mentioned in manual
little use to client related to DOT & work groups oriented toward counselor	limited use to client not specified not specified	WSD is designed to teach very basic discrimination, assembly & packaging skills
yes yes 1 week not available	no none not applicable not applicable	yes yes 1 day included in purchase price
secondary school students no data available no data available	3 major groups, characteristics well defined test-retest .80's and .90's correlations between scores & supervisor's ratings .86 & .92	MTM no data available no data available

OUTLINE	WOWI	
1. Development a. Sponsor b. Target Group c. Basis of System	Robert E. Ripley wide range: students, adults, business, VR clients DOT & GOE	
2. Organisation a. Number of Work Samples b. Grouping of Work Samples c. Manual	4 major testing areas 4 vocational areas single manual, some details missing	
3. Physical Aspects a. Packaging b. Durability c. Expendable Supplies d. Replacement e. Computer Requirements	not relevant reusable test booklets printer paper, test forms disk returned to developer for resetting IBM, 1 disk drive, 128K RAM	
4. Vocational Evaluation Process a. Preliminary Screening b. Sequence of Work Sample Administration c. Client Involvement d. Evaluation Setting e. Time to Complete Entire System	not specified by vocational area considerable for a formal testing situation formal testing situation 45 minutes to 1 1/2 hours	
5. Administration a. Procedures b. Method of Instruction Giving c. Separation of Learning/Performance d. Providing Assistance to Client e. Repeating Work Samples	not given in manual computer administered, self-administered minimal no procedures given in manual not relevant	

OUTLINE	WOWI	
6. Scoring and Norms a. Timing b. Timing Interval c. Time Norms d. Error Scoring e. Scoring Aids f. Quality Norms g. Emphasis in Scoring	Not relevant; computer scored and printed either locally or sent to developer for scoring	
7. Observation of Clients a. Work Performance b. Work Behaviors c. Recording System d. Frequency of Observation	no client observations made	
8. Reporting a. Forms b. Final Report Format	separate answer sheet 2 report formats, computer generated	
9. Utility a. Vocational Exploration b. Vocational Recommendations c. Counsel Utilization	little use to client no specific recommendations made as initial screening device	
10. Training in the System a. Training Required b. Training Available c. Duration d. Follow-up	no yes-cassette tape not mentioned no information available	
11. Technical Considerations a. Norm Base b. Reliability c. Validity	several groups; procedures not given variety of methods most in .80's correlations with other tests	

Apticom

1. Development

- a. **Sponsor** - The Apticom was developed by the Vocational Research Institute division of the Philadelphia Jewish Employment and Vocational Services (JEVS). Unlike other JEVS products, this is not a work sample system in the strict sense of the word; it is a computerized assessment or testing system.
- b. **Target Group** - The Apticom is designed for English or Spanish speaking disadvantaged job applicants, high school or special education students, and rehabilitation clients. The apparent purpose of the system is to provide a quick vocational assessment of three major areas: aptitudes, interests and educational levels. The Apticom tests appear most useful for initial assessment. The purpose of the system is to combine aptitude, interest and academic skills into meaningful job recommendations.
- c. **Basis of the System** - The aptitude part of the system is based on the U.S. Department of Labor definitions of 10 of the 11 Aptitudes (except Color Discrimination), with much of the design and test item formats closely resembling those of the General Aptitude Test Battery. The Occupational Interest Inventory is based on the twelve interest areas (e.g., Artistic, Selling) defined in the Guide for Occupational Exploration. This interest measure was developed from the USES Interest Inventory. The Educational Skills Development Battery was derived from the General Educational Development (GED) Language and Mathematics scales; there are six levels of these two scales. In summary, each part of the system is based on specific DOL job analysis and test variables. The results cross-match the GATB Occupational Aptitude Patterns (OAPs) (U.S. Department of Labor, 1980) with the GOE Work Groups (i.e., the 66 four digit GOE codes).

2. Organization

- a. **Name and Number of Work Samples** - The Aptitude section contains 11 specific tests measuring ten aptitudes: G, V, N, S, P, Q, K, F, M and E:²
 - (1) Object Identification - P (1 minute; 30 items)
 - (2) Abstract Shape Matching - P (2 minutes; 30 items)
 - (3) Clerical Matching - Q (1 minute; 30 items)
 - (4) Eye-Hand-Foot Coordination - E (45 seconds)
 - (5) Pattern Visualization - S and G (5 minutes; 30 items)
 - (6) Computation - N (4 minutes; 30 items)
 - (7) Finger Dexterity - F (2 minutes)
 - (8) Numerical Reasoning - N and G (7 minutes; 23 problems)
 - (9) Manual Dexterity - M (2 minutes)
 - (10) Word Meanings - V and G (2 minutes, 15 seconds; 30 items)
 - (11) Eye-Hand Coordination - E (45 seconds)

The Occupational Interest Inventory is a single test of 162 items, using a like-?-dislike format.

² See Glossary for definitions.

The Educational Skills Development Battery contains two separate tests:

- (1) Language Skills Development (10 minutes; 30 items)
 - (2) Math Skills Development (15 minutes; 30 items)
- b. Grouping of Work Samples - The tests are grouped into the three areas listed above. Individual tests within each area are administered in the order listed above.
- c. Manual - The system contains an administrative and a technical manual. The administration manual begins with very detailed directions and diagrams on setting up the administration and scoring equipment. There follows a separate section for each test battery and for each test within each battery. All instructions to be read verbatim are contained in "shadow boxes"; the accompanying demonstrations are also printed. The administration manual also contains detailed procedures for both hand and machine scoring, various conversion charts and tables. The format promotes easy use and the content of the manual is complete.

The technical manual consists of development and interpretation sections for each of the three parts of the battery. These sections contain explanations for all development steps that are easy to follow and understand.

3. Physical Aspects

- a. Packaging of Work Samples - The Apticom system is completely self-contained. The entire system is sold as a unit. The Apticom consists of a dedicated computer and several testing devices. The major device is a plastic board about 18 by 24 inches, containing an array of holes that correspond to test answers. Except for the apparatus tests, all test items are contained on plastic overlays that are placed on this board. The client uses a wand to select between alternatives. The system also includes various computer controlled devices for measuring the dexterity aptitudes.
- b. Durability - The computer hardware is sturdy and portable, but should be handled with care in transit. Test overlays can be cleaned with mild soap and water. This reviewer recommends careful use and storage of this equipment.
- c. Expendable Supplies - The only expendable supplies are the various report forms and paper for the printer (optional).
- d. Replacement - All replacement parts must be obtained from VRI. If hand scoring is used, the school or facility may duplicate the appropriate forms for local use. It must be pointed out that unlike many work sample systems, the Apticom is a computer driven test system requiring no supplies such as wood, metal or plastic.
- e. Computer Requirements - The heart of the system is a dedicated computer that is critical for all administration and scoring. Because the Apticom is equipped with an RS-232-C serial interface, a serial printer can be connected directly to the control console. The results can also be downloaded to an IBM-PC or IBM compatible computer for storing client results.

4. Vocational Evaluation Process

- a. Preliminary Screening - No mention of preliminary screening is given in the manual. However, this reviewer believes that the Apticom is best used for this function.
- b. Sequence of Work Sample Administration - Although there is no set sequence for administering each of the three batteries, the tests within each battery are administered in a set sequence. The aptitude tests are administered in the order they are listed in section 2.a. This arrangement is intended to alternate between the dexterity, perceptual and cognitive aptitudes to reduce fatigue. In the Educational Skills Development Battery the Language skills are administered first.
- c. Client Involvement - There appears to be very little client involvement during the actual testing process. Although the manual contains no provision for sharing the results with the student or client, the Apticom report format is designed for client use.
- d. Evaluation Setting - Although not specifically stated in the manual, the Apticom creates a formal testing atmosphere.
- e. Time to Complete the Entire System - The timed sections of the Aptitude Test Battery total 28 minutes, 15 seconds. The timed portions of the Educational Skills Development Battery total 25 minutes. These times do not include instructional and practice times. The Occupational Interest Inventory is untimed; most persons should be able to complete it in about 20 minutes. The entire Apticom could be administered in about 1 and 1/2 to 2 hours.

5. Administration

- a. Procedures - Each test is clearly explained and information needed for correct administration is provided.
- b. Method of Instruction Giving - All instructions are oral, accompanied by some demonstration. The evaluator reads the instructions directly from the administration manual. Although reading is required for many of the tests, none of the instructions require reading. The only instruments that include items beyond a fourth grade reading level are power tests specifically designed to assess verbal aptitude and language skills.
- c. Separation of Learning/Performance - The student is given a very short practice session prior to each test. There are no specific criteria to be reached in order to move from the practice section to the performance section. Thus, although there is some separation of learning and performance, it is entirely possible that some clients would start the tests without clearly understanding the instructions. The highly speeded practice and test sessions only increase this problem.
- d. Providing Assistance to the Client - Apparently assistance is allowed during demonstration and practice; the manual does not give any procedures for helping clients having difficulty once the performance session has started.

- e. Repeating Work Samples - This is not mentioned in the manual. Because of the practice effect it is assumed that the tests are not to be repeated.

6. Scoring and Norms

- a. Timing - The computer contains pre-set times for each test, except the interest inventory. Timing for each test is started by the evaluator. He/She simply presses the start button. The system will beep and turn the control lights off when the predetermined time is up for each test.
- b. Timing Interval - The teacher/evaluator begins timing after the completion of the practice session.
- c. Time Norms - This is not relevant for the Apticom.
- d. Error Scoring - The final raw score for each test, except the interest inventory, is the number of correct responses.
- e. Scoring Aids - The entire Apticom is completely computer scored.
- f. Quality Norms - This is not relevant for the Apticom.
- g. Emphasis in Scoring - This is not relevant for the Apticom; the final raw score is the number of correct responses for each test.

There are two basic ways to score the Apticom results. In the manual procedure, the raw test scores are read from a display following each test. These scores are recorded on various forms (see below) and then converted using a series of norms tables. If a printer is available, the dedicated computer performs all scoring and the final report is complete with explanations of all test variables that are printed.

7. Observation of Clients

- a. Work Performance -
- b. Work Behaviors -
- c. Rating System -
- d. Frequency of Observation -

} There is no mention of behavioral observations in the manual. Because of the short testing time and the formal nature of the test, client observation is not relevant.

8. Reporting

- a. Forms - There are three Apticom profile sheets used in hand scoring:
 - The Individual Aptitude Profile consists of data and client identification information, followed by a chart that plots the 11 tests to measure the ten aptitudes. It is possible to chart a grade adjustment for ninth and tenth grade students. As with the GATB, the standard error of the measurement (SEm) can be added to each aptitude score. A percentile equivalent can also be calculated.

- The Occupational Interest Inventory Profile Sheet consists of two charts for plotting the 12 GOE interest areas. Interest inventory scoring is based on the frequency of "like" responses.
 - The Educational Skills Development Profile Sheet contains client identification information and scores on each of the first four GED scales.
- b. Final Report Format - There are several options for producing a final report either by downloading the results on a PC or by directly printing from the Apticom computer. The contents of the standard report are as follows: The Aptitude Test Battery section contains the raw and standard test scores for each of the 11 tests. Aptitudes are given in standard scores and percentiles as well as graphically. The Occupational Interest Inventory gives the number of "like," "?" and "dislike" scores for each of the 12 interest areas and the percentile for each score, compared to the entire norm group and to male and female subgroups. Standard scores and a graphic display are presented for each interest scale. A statistical idiographic analysis is also conducted to establish the client's high interest area(s). The Educational Skills Development Battery section contains the number of correct responses for each of the four GED levels and a content analysis.

The heart of the final report is the Vocational Recommendations section. This section lists all four-digit GOE codes (i.e., Work Groups) that are viable based upon the client's high interest areas and aptitude scores (when the latter are compared against GATB Occupational Aptitude Patterns). The report also includes examples of specific jobs, with DOT codes and GED and SVP requirements, based upon the GED scales attained on the mathematics and language achievement tests. The recommendation section then provides cross-classification of interest, aptitude and educational levels.

9. Utility

- a. Vocational Exploration - The Apticom does not provide any actual experiences that reflect competitive employment. It is strictly a testing system.
- b. Vocational Recommendations - The Apticom provides Work Group and job matches. These are specific and state the DOT title and code number. The specific vocational recommendations are the central feature of the system.
- c. Counselor Utilization - The computer generated report would be very useful for providing specific information to the referring counselor or teacher.

10. Training in the System

- a. Training Required - No training is required prior to purchase.
- b. Training Available - The availability of training is not mentioned in the manuals. More recently, however, VRI has introduced a 45 minute VHS videotape with workbook that reviews system set-up, operation, administration and score/report interpretation.
- c. Duration - Not mentioned in manual.

- d. Follow-up - Not mentioned in manual. A toll-free telephone number is provided for customer use.

11. Technical Considerations

- a. Norm Base - The aptitude battery was developed on selected samples of younger persons in the U.S. and was standardized on adults in the U.S. and Canada. The interest inventory contains two separate norms: (1) secondary students and (2) employed adults. Because the educational battery was developed using a criterion referenced approach, norming was not necessary (Hupp and Donfrio, 1983). In general all samples are fully described and most are of adequate size. The development of norms was straightforward and technically sound.
- b. Reliability - Internal consistency, standard error of the measurement (SEM) and test-retest reliability coefficients are presented for both tests and aptitudes. Aptitude test-retest reliabilities range between .65 and .89, with most being higher than .80. Although these are adequate, the SEM's are rather large when compared to the frequency distributions. Alpha coefficients and test-retest reliabilities were presented for the 12 interest areas. These results were compared to the USES Interest Inventory. The shorter Apticom interest scales had in almost all cases just as high or higher reliability coefficients than the USESII. No reliability data were reported for the educational skills tests.
- c. Validity - The aptitude tests and interest inventory were validated against their U.S. DOL counterparts. Correlations between Apticom and GATB aptitudes were in the .80's for the three cognitive aptitudes, in the .60's for the perceptual aptitudes, and the .50's for dexterity skills. The manual also compares factor analyses of the GATB and Apticom aptitudes. The GATB factor structure resulted in two factors, interpreted as cognitive/perceptual and motor. The Apticom has three factors: cognitive, perceptual and motor. The Apticom developers rightly interpreted this as a strong indication of the soundness of the Apticom aptitude tests. The interest inventory was validated against its USES equivalent. Correlations reported for three samples ranged from .67 to .90. When the length of the Apticom interest inventory is taken in account, these are quite high. The Educational Skills Development Battery was developed using a content validity approach in which all test items were rated by experts for their GED level.³

Thus, at present all reported validity is based on correlations with widely used USES tests. Although the reported results are very impressive, the Apticom definitely needs empirical validity.

12. Reviewer's Summary and Contents

The Apticom is designed to provide either a quick assessment of a person's vocational capabilities or as an initial screening device for a longer vocational evalua-

³ There are six levels of Mathematical and Language development. The Apticom was developed using only the lower four levels. These four levels range from grade one to grade 12. Given the target population of the Apticom, these four levels appear to be appropriate.

tion. The central part of the system is its ability to combine the three factors commonly used in vocational testing, i.e., aptitudes, interests and academic performance levels. Of these the relationship between aptitudes and interests is the most critical. This is not a new concept nor are the basic types of tests original. According to its manual, the major reason for the existence of the Apticom is to reduce client/student test anxiety or boredom. In addition, the total testing time to obtain these data is much shorter than it would be if the corresponding USES tests were used.

If the information reported in the technical manual is correct, the initial development of the Apticom has resulted in a technically sound test battery. The remarkable thing about this development is that the highly speeded Apticom tests have reliability coefficients that meet or exceed those of the much longer USES tests. The VRI staff can be very proud of this. As stated above, the initial validation of the instrument against USES tests has resulted in significant construct validity coefficients. Although this is an excellent beginning, the instrument definitely needs concurrent and predictive validation research.

The manuals are easy to understand and follow, the standard printed report contains all necessary information and the physical apparatus is easy to operate and control. These features, plus the short administration time and the reported technical aspects, make the Apticom an impressive instrument.

13. Address

Vocational Research Institute
2100 Arch Street
Philadelphia, PA 19103

14. Cost

Single Apticom Unit	\$5,350.00
Single Apticom Unit with printer	\$6,000.00
Midi System (2 Apticom units, master control, 2 printers)	\$12,400.00
Maxi System (4 Apticom units, master control, 4 printers)	\$22,300.00
Spanish/Bilingual Kit (overlays/manual)	\$495.00

15. References

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Gucawa, B., Splete, H., & Stum, D. (1985). Vocational assessment systems: A review of Apticom, MESA and SAGE. Michigan Personnel and Guidance Journal, 16(1, Winter).

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The Career Evaluation System

(Series 100, 200/230 and 300)
(CES)

1. Development

- a. Sponsor - Originally developed by Goodwill Industries of Chicago under a Rehabilitation Services Administration, U.S. Department of Education grant, the CES was further developed, refined and marketed by Career Evaluation Systems, Inc.
- b. Target Group - The three major divisions of the Career Evaluation System are intended for different populations: The Series 100 tests a normal population from ages 16 to 65 for selection and training in business and industry. The Series 200, the original system, is intended for assessing a wide variety of persons with physical, sensory and/or psychological handicaps. A subset of the Series 200, the 230, tests either the general population or disabled persons who are low readers or non-readers. The Series 300 was designed for mentally retarded persons. The systems have been used successfully in schools, pain centers, hospitals, correction facilities, manpower training programs, rehabilitation facilities and industry.
- c. Basis of the System - Originally based almost exclusively on the third edition of the Dictionary of Occupational Titles, the system's data base (see 11c.) has been revised for the newer fourth edition and the Supplement. The Series tests isolated traits (or specific aptitudes) and combines these into scores for each function on the Data-People-Things "hierarchy." For example, a client's optimum job level could be classified as a .231 (i.e., Data level of 2, People level of 3, and Things level of 1). The initial selection of the isolated trait tests and factors were derived from research done by Dr. Hester in the late 1960's and 1970's. Physical and environmental conditions, General Educational Development, and Specific Vocational Preparation are also considered. CES is not a work sample system; it is a battery of psychological tests and ratings designed to relate client scores to the DOT.

2. Organization

- a. Name and Number of Work Samples - Each Series uses a different number of pencil-and-paper tests, apparatus tests and ratings. The name of the test, the specific aptitude(s) measured and the number of the Series it is in are as follows:
 - (1) Minnesota Paper Form Board - Spatial perception; Series 100, 200/230 and 300.
 - (2) (Raven) Standard Progressive Matrices - Abstract reasoning; Series 100, 200/230 and 300.
 - (3) SRA Verbal Form - Verbal and numerical reasoning; Series 100 and 200.
 - (4) Gates-MacGinitie Reading - Reading comprehension; Series 100, 200/230 and 300.
 - (5) Wide Range Achievement Test (Revised) - Arithmetic level; Series 100, 200/230 and 300.
 - (6) SRA Leadership Opinion - Leadership; Series 100 and 200.

- (7) SRA Sales Attitude - Sales/persuasion; Series 100 and 200.
- (8) IPAT CAB-Cf (Hidden Designs) - Perceptual accuracy; Series 100 and 200/230.
- (9) IPAT Similarities - Perceptual accuracy; Series 300.
- (10) IPAT CAB-Cs - Decision speed; Series 100 and 200.
- (11) Purdue Pegboard - Finger dexterity; Series 100, 200/230 and 300.
- (12) Minnesota Rate of Manipulation - Manual dexterity; Series 100, 200/230 and 300.
- (13) Etch-a-Sketch with overlay - Two-hand coordination; Series 100, 200/230 and 300.
- (14) Electro-tach Tachistoscope - Perceptual speed; Series 200/230 and 300.
- (15) Multi-Choice Reaction Test - Reaction time and response orientation; Series 200/230 and 300.
- (16) PTI Oral Directions Test - Following direction; Series 100, 200/230 and 300.
- (17) Hand Dynamometer - Hand strength; Series 100, 200/230 and 300.
- (18) Hole Steadiness Plate - Arm-hand steadiness; Series 100, 200/230 and 300.
- (19) Hole Steadiness Plate with backplate - Precision aiming; Series 100, 200/230 and 300.
- (20) Tapping Board - Wrist-finger speed; Series 100, 200/230 and 300.
- (21) Two-Arm Tracing Test - Two-arm coordination; Series 100, 200/230 and 300.
- (22) Polar Pursuit Tracker - Fine perceptual motor coordination; Series 200/230 and 300.
- (23) Bennett Hand Tool Test - Hand-tool dexterity; Series 200/230 and 300.
- (24) Foot-operated Stapler - Multi-limb coordination; Series 200/230 and 300.
- (25) Paper Feeding Machine - Machine feeding; Series 200/230 and 300.
- (26) Depth Perceptual Test - Depth perception; Series 200/230 and 300.
- (27) Lifting Platform - Isometric lifting; Series 200/230 and 300.
- (28) Mirror Tracing Apparatus - Visual motor reversal; Series 200/230 and 300.

In addition to these tests, the evaluator rates the client's ability on several People Functions (i.e., Mentoring, Negotiating and Entertaining) in the Series 100 and Series 200/230.

- b. Grouping of Work Samples - Although each test is treated as an independent variable in scoring, the tests are grouped into four categories for administration: pencil-and-paper tests (1 through 10), apparatus tests (11 through 17), tests using the master control unit (18 through 22) and non-mobile tests (23 through 28). In addition, the printout containing the results, classifies the tests into seven groups or second order factors: unilateral motor, bilateral motor, perceptual-motor coordination, perceptual, intelligence, achievement and People test functions.
- c. Manual - There is a separate manual for each series. Each contains the following chapters: Introduction, General Administration, Apparatus Tests, Paper/Pencil Tests, Data Entry Instructions, Interpretation of Printout and Appendices. Each manual gives detailed procedures for administration and scoring, samples of data entry forms, and computer printouts of results with interpretation. The manuals are well organized and very easy to use. Finally, there are short manuals for telecommunications and equipment set-up. There is also a training manual.

3. Physical Aspects

- a. Packaging of the Work Samples - Each apparatus and test are packaged separately for shipping. The standardized psychological tests can be ordered directly from their respective publishers.
- b. Durability - Although no specific information on repair and replacement rates were available, the apparatus should be fairly durable if properly maintained. Some of the apparatus must be recalibrated regularly.
- c. Expendable Supplies - The only apparatus tests using expendable supplies are the paper feeding machine and the foot operated stapler. The CES uses many test forms, answer sheets, etc.
- d. Replacement - Because the systems use precision apparatus, all replacement parts must be ordered from the developer. Paper-and-pencil tests can be ordered from their publishers.
- e. Computer Requirements - When using a telecommunications system for scoring, the user first enters raw test scores into a microcomputer; these are transmitted to CES via a modem for scoring. The results are transmitted back to the user, written on the disk, final computations are completed, and printed on his/her printer. Telecommunications software is available for both IBM and Apple. The following specifications are for IBM-PC/XT or AT: at least 128 K RAM and two disk drives, monitor, printer and Hayes 1200 baud SmartModem. Apple computers require: at least 128 K RAM, two disk drives, monitor, printer and Hayes 1200 baud SmartModem. In addition, the appropriate cards, DOS, and cables are required.

4. Work Evaluation Process

- a. Preliminary Screening - No preliminary screening is required. The systems can be used alone as assessment devices or as screening tools at the beginning of a longer vocational evaluation.
- b. Sequence of Work Sample Administration - With one exception, the tests do not have to be given in any specific order. The Series 100 manual contains suggested schedules for group testing.
- c. Client Involvement - Because of the formal nature of the testing process and the emphasis upon accurate measurement, there is little client involvement during actual testing.
- d. Evaluation Setting - The assessment process results in a formal testing atmosphere. The emphasis on accurate measurement using psychophysical devices to determine reaction time, etc. creates a laboratory setting.
- e. Time to Complete the Entire System - Because the number of tests differs with each Series, each system takes a different amount of time. The Series 100 tests can be given in about 3 1/2 hours, with up to 12 persons tested at one time. Series 200/230 is administered in about 4 hours; the paper-and-pencil tests can be given in small groups of 5 or six. It is estimated that the Series 300 can be given to small groups in 4 hours. In each Series the

apparatus tests are given individually; the pencil-and-paper tests are given in small groups.

5. Administration

- a. Procedures - For each test the manuals give the purpose, materials, test conditions, practice period (if any), administration, scoring and data recording. In addition, test manuals are provided for all commercially available tests. All procedures are thoroughly defined.
- b. Method of Instruction Giving - All instructions are read aloud to the client and many are accompanied by short demonstrations. The communication method may be varied to accommodate special client or student problems (e.g., hearing loss). Reading is only required for those tests where reading is part of the testing process.
- c. Separation of Learning/Performance - The manual emphasizes this separation and urges that, within the limits of the test, the student should have a practice period to understand the test.
- d. Providing Assistance to the Client - The evaluator is to make certain that the testee fully understands the instructions for each test. No assistance is given during the actual administration of the tests.
- e. Repeating Work Samples - Tests may be readministered if there is reason to believe that a student or client was erratic or he/she was not functioning at his/her normal level. Testing may be repeated within two or three days of initial administration. The higher score is usually reported.

6. Scoring and Norms

- a. Timing - The evaluator times the client. The timing of the psychophysical tests is carefully controlled by electric timing devices. A stopwatch or other timing device is used for the paper-and-pencil and dexterity tests.

Although all results are scored by CES in a central location, there are three methods of transmitting assessment results: (!) use of a personal computer with a modem for direct scoring, (2) mailing in the Data Entry Form, and (3) telephoning in the results to CES clerical staff.

- b. Timing Interval - For many tests, timing is the speed with which the client responds to a specific stimulus by performing highly unique responses. A few tests are timed from either start to completion or for a set period of time.
- c. Time Norms - No separate time norms are presented.
- d. Error Scoring - A few separate error scores are computed. The psychophysical tests use mostly time to completion or the number of responses performed within a definite time limit.
- e. Scoring Aids - A few transparencies are used to quickly identify correct answers.
- f. Quality Norms - This is not applicable; no quality scores are used.

- g. **Emphasis in Scoring** - The emphasis is on time to completion, number of responses performed within a definite time limit, or number of correct responses.

7. Observation of Clients

- a. **Work Performance** - No work performance factors are observed.
- b. **Work Behaviors** - The Series 300 lists 15 separate behaviors to be observed under three headings: job performance and productivity, work habits and attitudes, and social behaviors. No specific observation methods or procedures are given in the manual.
- c. **Rating System** - In the Series 100 and Series 200/230 the People functions of Mentoring, Negotiating and Entertaining⁴ are rated on a six point scale. Each scale value is generally defined. In the Series 300, work behaviors are rated on a five point scale, ranging from work activity center level to competitive employment.
- d. **Frequency of Observation** - Because no work performance or behaviors are directly observed, this is not relevant.

8. Reporting

- a. **Forms** - Standard forms are used to record responses on most of the psychophysical tests. All data, together with demographic information, are transferred to the Data Entry Form prior to computer scoring and job selection. Although there are separate versions of the Data Entry Form for each Series, all forms contain: agency information, client demographics, People relations, test scores. In addition, the Series 200/230 lists physical and environmental limitations; the Series 300 contains the 15 work behaviors.
- b. **Final Report Form** - The same basic report format is used for each Series. "The computer transforms raw test scores into scale scores using a 1 to 6 scale. The highest score attainable is 6.0 and the lowest is 1.0." The print-out contains four major sections: (1) the demographic and identification information supplied by the user, (2) the scores on each test, on a scale of between 1.0 and 6.0 (in the Series 200/230 and 300 these are also given graphically), (3) the Data-People-Things "hierarchies" showing the client level of functioning, and (4) specific DOT occupational titles and codes, the DOT page number of the occupational definition, GOE codes, strength requirement, GED and SVP. The jobs listed are classified into four groups, depending on the probability of occupational success for the client: very feasible, feasible, possible and conceivable.

⁴ In the Series 200/230 People functions of Speaking/Signaling, Serving and Following Directions can be determined either by rating or by scores on the Oral Directions Test.

9. Utility

- a. Vocational Exploration - The formal testing atmosphere and the lack of introductory explanations relating the tests to jobs offers the client almost no chance for vocational exploration.
- b. Vocational Recommendations - The major purpose of the system is to make specific vocational recommendations. As stated above, the printout lists specific job titles.
- c. Counselor Utilization - The system is designed to report jobs that are within the client's or student's abilities. This information, if communicated to the referring counselor effectively, could be very useful as a realistic basis for client choice, to broaden student vocational expectations, to help screen local opportunities, and to plan training for technical vocations.

10. Training in the System

- a. Training Required - Training and certification are required prior to use.
- b. Training Available - Training is given on audio-cassettes; there is also a certification test.
- c. Duration - Training is approximately 12 hours, at trainee's discretion.
- d. Follow-up - This is available by telephone. On-site, hands on training is available on request.

11. Technical Considerations

- a. Norm Base - No information on norms is given in any of the manuals. However, CES states they are in the process of developing normative data; this is based on cases that already exist in the system.
- b. Reliability - Test-retest reliabilities for individual tests on 45 clients retested after four weeks ranged from .72 to .95; these are high. The second type of reliability is the duplication of the list of DOT defined jobs. In a test-retest situation, 78% of the job families listed on the first printout were the same as those listed on the second.
- c. Validity - There are very little data. The construct validity of the system is based on several factor analyses; however, none of these are given in the manuals. A single concurrent validation study of 156 dentists demonstrated that 80% of the dentists "would have been recommended to enter dentistry."

A few words must be said about data bases. The Series 200/230 has a data base of over 2,400 occupations carefully selected from the DOT; the Series 100 has over 2,300. There is considerable overlap between the two. The Series 300 data base contains over 1,400 separate jobs. The jobs in each data base were selected on the basis of: (1) commonly available in the national economy and (2) representative of a group of closely-related occupations. The Series 300 data used a third criteria: the jobs were within the competencies of mentally retarded persons.

12. Reviewer's Summary and Comments

The Career Evaluation Systems Series 100, 200/230 and 300 use the human factors approach that has been a test development model for over 40 years. This approach has proven successful for many psychological tests. Each Series attempts to present a picture of the client's or student's specific aptitudes and to match these aptitudes with the structure of the DOT. This logical structure has a definite appeal to persons who stress aptitude testing either as part of a longer vocational evaluation process or depend on this testing for assessment.

Career Evaluation Systems, Inc. has used a unique approach in taking one testing system originally designed for all disabled persons and dividing it in three separate systems aimed at different populations. This results in increased flexibility for the teacher or evaluator. The system does not claim to be a complete vocational evaluation system; CES realizes the need for occupational information, interest testing and evaluator interaction with the client. The three Series could be best described as a very logical series of tests designed to relate client abilities to the Data-People-Things "hierarchies" of the DOT. The chief advantages of the three Series are: (1) the ability to test a large number of persons in a short time, (2) the direct relation between testing results and jobs in the DOT, (3) the use of what the developer calls a "fuzzy logic" approach to sort selected jobs in four groups by predicted probabilities of success, and (4) the inclusion of specific tests to measure at least some of the People functions.

The problems with the three CES Series are largely technical. There are no technical manuals or technical sections within the manuals containing normative information, reliabilities and validation studies. Although many of the standardized tests (e.g., Wide Range Achievement Test) have adequate technical data in their respective manuals, the CES developed tests do not have comparable data.

13. Address

Career Evaluation Systems, Inc.
7788 Milwaukee Avenue
Niles, Illinois 60648

14. Cost

License Fee (This one time fee includes start-up costs, training cassettes, system manual, test manuals, scoring keys, data entry forms, and newsletter subscription)
..... \$2,500.00

Package A: Telecommunication Software
For Series 100, 200/230 and 300. \$1,990.00
Series 100 \$650.00
Series 200/300 \$950.00
Series 300 \$650.00

Package B (instruments used with master control unit for automatic scoring)
..... \$2,090.00

Package C (apparatus tests) \$2,050.00

Package D (paper-and-pencil tests) \$370.00

Optional non-mobile test apparatus (total)	\$2,835.00
Complete Systems without Package A:	
Series 100	\$6,800.75
Series 200/230	\$6,985.25
Series 300	\$6,935.90

Note: Individual components of Packages B, C, and D can be ordered. Thus, if the facility already has some of the testing equipment, they need not re-purchase it.

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Key Educational Vocational Assessment System

(KEVAS)

1. Development

- a. Sponsor - The system was developed by Dr. Alvin Krass of Key Education, Inc. of Shrewsbury, New Jersey.
- b. Target Group - KEVAS is designed for a wide variety of both handicapped and "normal" populations, including high school students, dislocated workers and competitively employed adults. Because the language based measures can be varied to fit the assumed reading skills of the group tested, the system can serve a wide range of abilities.
- c. Basis of the System - According to the manual, KEVAS was designed "to tap basic elements of psychophysical functioning, that is, those underlying perceptual skills which are fundamental for learning." The system contains a wide variety of cognitive, perceptual, dexterity and attitude tests and measures.⁵

"KEVAS development is focused toward integrating the vocational matching protocol, which matches individual performance profile to occupational and/or training requirements. To date, functional criteria have been developed for more than 600 occupations and 75 vocational training programs" (Krass and Conlon, 1986, p. 225).

2. Organization

- a. Name and Number of Work Samples - The system is a combination of apparatus, achievement, interest and personality tests. Some were developed by Key Education Inc.; others were commercially available tests. The tests and what they purport to measure are as follows:
 - (1) Key Audiometer - Hearing.
 - (2) Key Audiometer - Auditory localization.
 - (3) Key Audiometer - Auditory memory.
 - (4) Ciba-Geigy Chart - Visual acuity.
 - (5) Ciba-Geigy Chart - Color acuity.
 - (6) Key Audiometer and Key Tabletop Lab/Learning Code Component - Visual memory.
 - (7) Key Fine Motor Skills Test - Manual dexterity.
 - (8) Key Tabletop Lab/Reaction Time Component - Auditory reaction time.
 - (9) Key Tabletop Lab/Reaction Time Component - Visual reaction time.
 - (10) Key - What's Next? - Abstract reasoning ability.
 - (11) Key Tabletop Lab/Learning Code Component - Non-verbal learning ability.
 - (12) Key Tabletop Lab/Learning Code Component - Response to stress.
 - (13) Key Tabletop Lab/Dynamometer Component - Persistence.
 - (14) Key Form S-3 - Literacy skills.

⁵ The reader should note that unlike most work sample systems, KEVAS has no relationship to the DOT or other job classification systems.

- (15) Key Arithmetic Test - Arithmetic skills.
 - (16) Wide Range Achievement Test Reading Scale - Reading level.
 - (17) Key Vocational Interest Inventory and Self-Directed Search - Vocational interest.
 - (18) Key Social Competence Rating - Social competency.
 - (19) How Supervise - Supervisory potential.
 - (20) Sentence Completion & Graphic Projectives - Personality attributes.
- b. Grouping of Work Samples - Because many of the measures use the same piece of apparatus, several assessments are made at the same time. All tests are administered in a prescribed order. The manual classifies the tests into three general groups: (1) measures of psychophysical functioning (e.g., Fine Motor Skills, Color Acuity), (2) measures of work-related competencies (e.g., Literacy, Spatial Relations) and (3) attitudinal and motivational measures (e.g., Social Competency, Supervisory Knowledge).
 - c. Manual - The system manual, contained in a single loose-leaf binder, gives the procedures for test administration plus supplementary material on the KEVAS. The manual contains the following sections: Historical Perspective of Test Development, Description of the Key System, Administration of the Key System, Key System Output and General Information. The administration section contains complete instructions for administering all tests and recording the results on scoring sheets. In the few places where ratings or judgments need to be made, rating criteria are clearly defined. Because all measurements are scored by Key Education, Inc. no scoring procedures are given in the manual. No information on how to interpret results is included. Finally, there is no information of sharing results with clients.

3. Physical Aspects

- a. Packaging of the Work Samples - The apparatus is self-contained. The paper-and-pencil measures are packaged in folders. Examiner recording sheets, literacy measures and checklists are packaged in predetermined quantities. All test materials are shipped in sturdy, portable boxes.
- b. Durability - Most of the apparatus should be fairly durable if properly cared for.
- c. Expendable Supplies - Copies of the paper-and-pencil tests and reporting forms are the only expendable supplies.
- d. Replacement - Standardized tests can be ordered from their publishers. Broken equipment is returned to Key Education, Inc. for repair. When equipment malfunction is reported, the developer will ship replacement equipment immediately. All forms and tests copyrighted by the developer may not be reproduced without consent.
- e. Computer Requirements - Because KEVAS results are scored in a central location, there are no local computer requirements.

4. Vocational Evaluation Process

- a. Preliminary Screening - No preliminary screening is mentioned in the manual. Like some other assessment systems, KEVAS could be used as a preliminary device at the beginning of a lengthy vocational evaluation.
- b. Sequence of Work Sample Administration - Under normal circumstances, two examiners administer the tests. The manual recommends a evaluator/client of 1:4 or 1:5. In order to make the best use of time, each examiner administers different parts of the battery. The first test examiner gives the structured interview and the tests requiring the Key Tabletop Lab. While he/she is testing one client, another client is being tested by the second examiner on the following: Hearing Screening, Vision and Color Vision Screening, Reading Screening, Fine Motor Skills and Social Competency.

The order of test administration is inconsequential, as long as all subtests are completed. The subtests are viewed as components that can be administered in any order. Because the written tests require less than 1 and 1/2 hours, most groups can be tested on these in one sitting. However, written test administration may be broken into shorter testing sessions.

In order to stay familiar with all phases of testing, the two examiners are to exchange test administration duties on a routine basis.

- c. Client Involvement - Except from telling the examiners to conduct a brief orientation session prior to testing, the manual contains no mention of client involvement during test administration. In addition, there are no instructions for reporting results to the client. Because KEVAS is a standardized battery of tests, client involvement is assumed to be minimal.
- d. Evaluation Setting - The emphasis on accurate measurement using psychophysical devices to determine reaction time, dexterity, etc. results in a laboratory like environment.
- e. Time to Complete the Entire System - Test sessions "run between 2-1/2 and 3 hours." According to the manual, if two sessions are held during the day, between 16 and 20 clients could be assessed by two evaluators in one day.

5. Administration

- a. Procedures - Test administration procedures are given in paragraph format in the manual, with verbal instructions separated from demonstrations by quotes; this makes the verbal instructions difficult to locate. Procedures for recording apparatus and perceptual test results are given during the required examiner training.
- b. Method of Instruction Giving - There are two separate methods of instruction giving. The apparatus and perceptual tests are administered individually using a combination of verbal instructions and demonstration. The paper-and-pencil tests are described as largely self-administered. Although not instruction giving per se, some data are obtained from short interviews with the client.
- c. Separation of Learning/Performance - There is no mention of separation of learning and performance in the manual per se. Given the short practice

sessions that usually proceed many of the tests, there could be a problem separating the two.

- d. **Providing Assistance to the Client** - On some of the apparatus tests, the examiner carefully monitors client performance and corrects the client as needed. Providing assistance to clients during the paper-and-pencil tests is covered during training.
- e. **Repeating Work Samples** - There are no instructions for repeating work samples in the manual. Since KEVAS is an assessment device, it is assumed that tests would not be readministered under normal conditions.

6. Scoring and Norms

- a. **Timing** - In an attempt to reduce anxiety, none of the tests are timed. Subjects are instructed during the orientation period to "work at their own pace."
- b. **Timing Interval** - Because the tests are not timed, this is not relevant.
- c. **Time Norms** - There are no separate time norms per se; test results are recorded and sent to Key Education, Inc. for computer scoring.
- d. **Error Scoring** - Although errors are recorded for some of the psychophysical tests, most tests are only scored by the number of correct responses.
- e. **Scoring Aids** - No scoring aids are used.
- f. **Quality Norms** - This is not relevant for KEVAS.
- g. **Emphasis in Scoring** - Correct responses and reaction times are emphasized.

7. Observation of Clients

- a. **Work Performance** - No factors are defined or observed.
- b. **Work Behaviors** - The manual contains some information on specific behaviors that are to be observed during testing.
- c. **Recording System** - On one of the data recording sheets the test examiner can rate both client behavior and the testing environment as being "favorable" or "unfavorable."
- d. **Frequency of Observation** - This was not mentioned in the manual.

8. Reporting

- a. **Forms** - Each examiner has a separate form for recording test results; checklists are provided for users, when requested, to ensure that the administration is complete.

The projective drawings and sentence completion are reviewed, along with interpreted test data, by a clinical psychologist and results are summarized in a narrative. A bank of narrative paragraphs is used to generate personality

results and these are integrated into appropriate intervention recommendations (e.g., referral to DVR for specified services, further counseling suggested).

- b. **Final Report Format** - There are several report formats. The typical report begins with a list of the tests taken and a description of the rating scale used to report results: superior (significantly above the norm), above average (above the norm), average (this is divided into three separate classes: high average, within normal limits and low average), below average (below the norm) and impaired (significantly below the norm). Demographic variables such as education level and job history are provided. The next section lists the results from the interest inventory, self-directed search and the literacy test. Short narrative statements provide information on "intervention recommendations." Personality measures are also listed graphically. Specific vocational recommendations are listed by DOT title and code. All report formats are easy to read and understand.

9. Utility

- a. **Vocational Exploration** - Because of the abstract nature of the tests and the formal administration procedures, KEVAS would provide very few client career exploration experiences.
- b. **Vocational Recommendations** - The training recommendations contain jobs and specific locally available training programs.
- c. **Counselor Utilization** - The counselor's report includes impairments noted and intervention recommendations. The impairments and intervention recommendations provide a good basis for forming a variety of client recommendations.

10. Training in the System

- a. **Training Required** - Examiners must be certified before they use the system; this certification is good for one year. Training costs are \$300.00 per examiner; all travel expenses are the responsibility of the contracting agency.
- b. **Training Available** - Training is available from the developer.
- c. **Duration** - Two days of training are provided. The first six hour session is primarily instructional, while the second session includes demonstrated and supervised test administration.
- d. **Follow-up** - Recertification training is conducted on an annual basis. One day of training is conducted at a fee of \$150.00.

11. Technical Considerations

- a. **Norm Base** - There are three national data bases: normal adult population, normal youth population, and handicapped youth population. Samples are described in terms of area of country, sex, race and age. The system emphasizes the development of local data bases. Key Education has published several descriptive statistical studies on young adults (Key Education, 1985c), dislocated workers (Key Education, 1985b), handicapped high school students (Key Education, 1986). Preliminary local norms are developed based on small

samplings and are refined at N = 200 or at the completion of project milestones.

- b. Reliability - Reliability results for the Key Education, Inc. developed equipment are presented using a variety of methods, test-retest, split-half, KR 20, and Coefficient Alpha. Using sample sizes between 53 and 200, the study reported reliabilities coefficients of between .63 and 1.00. Most of the coefficients were in the .80's or higher. Given the shortness of most of these tests, these results are acceptable.
- c. Validity - There is no discussion of validation in the KEVAS manual. At present validation is limited to two studies predicting the job performance of corrections officers in Monmouth County, New Jersey (Conlon, 1985a) and the New Jersey Department of Corrections (Conlon, Krass and Penfield, 1985). In both of these studies, KEVAS results were validated against supervisor's performance ratings. Results indicated that the system could successfully predict job performance.

Although not strictly validity, a bank of more than 600 occupations, identified by DOT title and code but NOT utilizing DOT criteria, was developed based on labor market surveys conducted in the midwest, southeast and northeast.

Training programs are identified based on review of the options available to the user. Task analyses were conducted for many occupations and for all the training options included to date.

12. Reviewer's Summary and Comments

KEVAS is designed to assess a wide variety of populations on basic perceptual and other skills using a combination of apparatus and paper-and-pencil tests. In this respect the system is similar to the Career Evaluation System and McCarron-Dial (Work) Evaluation System. The major advantages of the system are its short administration time and the number of clients that can be assessed in one day. The manual is well-written and easy to use.

13. Address

Key Education Inc.
673 Broad Street
Shrewsbury, New Jersey 07701

14. Cost

There are two major pricing options:

Option I - Provision of complete vocational assessment services including Certified Examiners to administer tests on sites provided by the contracting agency. Includes complete data scoring and interpretative reporting services and group data maintenance. Travel expenses are additional. The cost per subject is:

Groups of 5 to 25	\$100.00 per subject
Groups of 26 to 49	\$85.00 per subject
Groups of 50 or more	\$75.00 per subject

Option II - Provision of training services for agency staff members, who then administer the test program. Provides training materials and conducts sessions either at Key Education, Inc. or at agency site. Costs for this option are:

Training services and materials	\$300.00 per examiner
Lease of test equipment	\$250.00 per month

All consumable test materials, complete scoring, data maintenance and individual reporting services (Graphic Report Format):

From 1 to 99	\$40.00 per subject
From 100 to 250.	\$35.00 per subject
From 251 to 499.	\$30.00 per subject
Over 500	\$25.00 per subject

Group Data Analysis Services - Once a group of clients has been included in the database, statistical analysis can be conducted. Summary statistics and recommendations are provided in report form on request and under separate agreement. Costs depend upon the size of the database to be studied.

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McCarron-Dial (Work) Evaluation System

(McCarron-Dial or MDS)

1. Development

- a. Sponsor - The MDS was originally developed by Lawrence T. McCarron and Jack G. Dial. It is presently being marketed by McCarron-Dial Systems, Inc.
- b. Target Group - The system can be used with special education and rehabilitation populations at any level of intellectual functioning and with disabilities in one or more of the following areas: physical, mental, emotional or functional behavior. Target disability groups include: learning disabled, emotionally disturbed, mentally retarded, cerebral palsied, closed head injured and socially handicapped or culturally disadvantaged. It can also be adapted for use with blind and deaf persons.
- c. Basis of the System - The MDS is based on a neuropsychological theoretical framework. The system includes an assessment of five factors: verbal-spatial-cognitive, sensory, motor, emotional and integration-coping. These five factors were derived from an assessment of three dimensions: verbal and synthetic-spatial skills; sensorimotor skills; and emotional-coping skills.

2. Organization

- a. Name and Number of Work Samples⁶ - The basic MDS consists of six separate instruments grouped into five factors: The six instruments included in the basic MDS are:
 - (1) Peabody Picture Vocabulary Test-R (PPVT-R)
 - (2) Bender Visual Motor Gestalt Test (BVMGT)
 - (3) Behavior Rating Scale (BRS)
 - (4) Observational Emotional Inventory (OEI)
 - (5) Haptic Visual Discrimination Test (HVDT)
 - (6) McCarron Assessment of Neuromuscular Development (MAND) - Contains ten short tasks to assess fine and gross motor abilities

Scores, if available, from the following categories of tests can also be factored into the analysis, prediction and programming model provided by the McCarron-Dial System:

- (1) Wechsler Intelligence Scales (WAIS, WAIS-R, WISC, WISC-R)
- (2) Academic achievement scores (WRAT, PIAT, etc.)
- (3) Supplemental instruments available from MDS, Inc. including: Perceptual Memory Task (PMT), Street Survival Skills Questionnaire (SSSQ) and Haptic Memory Matching Test (HMMT)
- (4) New MDS paper and pencil tests which may be added or substituted for existing tests including: OEI-R, Emotional Behavioral Checklist (EBC) and Survey of Functional Adaptive Behaviors (SFAB)

⁶ Note: The McCarron-Dial is not a "work sample system," per se.

- b. Grouping of Work Samples - The tests, tasks and scales are grouped according to five factors:

- (1) Verbal-Spatial-Cognitive: PPVT (also, if available, WAIS, academic achievement, PMT)
- (2) Sensory: BVMGT, HVDT (HMMT may be used in conjunction with HVDT with visually impaired persons)
- (3) Motor: MAND
- (4) Emotional: OEI (OEI-R or EBC may be substituted)
- (5) Integration-Coping: BRS (also, if available, SSSQ; SFAB may be substituted for the BRS)

- c. Manuals - The basic MDS comes with a system manual: McCarron-Dial Evaluation System: A Systematic Approach to Vocational Educational and Neuropsychological Assessment. This manual contains an overview of the system, administration and scoring instructions for all of the instruments plus data on combining and interpreting the results. Manuals for the BVMGT and PPVT are contained in the Auxiliary Kit. The HVDT, MAND, SSSQ and PMT each include individual manuals. The SSSQ also includes Curriculum Guides which give remediation strategies for deficit areas. All of the manuals are very detailed and thorough. In addition to adult norms, children's norms are contained in each manual.

3. Physical Aspects

- a. Packaging of the instruments - The basic MDS is packaged in three separate kits (Auxiliary Kit, HVDT and MAND), each about the size of a large briefcase. The Auxiliary Kit contains the Bender, PPVT, OEI, BRS, reporting forms and the system manual. Supplementary instruments (PMT, SSSQ and HMMT) are also contained in separate kits.
- b. Durability - Because the evaluator or psychologist sets up the equipment and is present at all times, there should be little problem with durability.
- c. Expandable Supplies - The only expendable items are the various test answer sheets, behavioral observation forms and report forms. No consumable materials are used.
- d. Replacement - All replacement parts must be ordered from the developer. This is absolutely necessary to maintain standardization of the testing materials.
- e. Computer Requirements - The MDS has the following optional scoring and report writing software: Computer Assessment Program for preparation of a comprehensive report, Occupational Exploration Systems for relating factor scores to over 2,000 DOT jobs, SSSQ Computer Report for scoring, plotting and referencing the SSSQ curriculum guide, Individualized Trait Analysis for Program Planning (ITAPP) analysis of 60 specific traits derived from the MDS and Remedial Motor Training for providing training activities to remediate identified neuromotor deficits.

These reporting programs are available for the following computers: IBM PC, XT and AT; Apple II, II plus, IIc and IIc; and TRS-80.

4. Work Evaluation Process

- a. **Preliminary Screening** - An interview with the client and the referral source is urged to obtain background data on the client.
- b. **Sequence of Instrument Administration** - Administration begins with factor one and continues through factor five. The order of administration can be altered depending on the needs of the client.
- c. **Client Involvement** - Client involvement is encouraged during the assessment period. Upon completion, the manual recommends individual counseling to provide help for the client toward realistic work-training goals and expectations.
- d. **Evaluation Setting** - A formal testing setting is used for each of the assessment instruments with the exception of the BRS and OEI. Behavioral observations made on the OEI (or OEI-R) may take place in a prevocational classroom or sheltered work setting. Supplemental instruments such as the SFAB and EBC may be used in the regular classroom or office setting.
- e. **Time to Complete the Entire System** - The formal testing required for the abbreviated battery can be completed in three hours or less. The comprehensive battery requires the formal testing plus systematic observation for up to five days in a work or classroom setting.

5. Administration

- a. **Procedures** - Instructions, materials needed, layout and scoring procedures are all specified in detail. Standardized tests are administered according to instructions in their test manuals.
- b. **Method of Instruction Giving** - All instructions are given orally, through demonstration or by total communication systems as needed.
- c. **Separation of Learning/Performance** - Most of the factors in the MDS are based on formal testing concepts which do not separate learning from performance. The HVDT and MAND allow for repeating of instructions, demonstrations and presentation of example items, but have no formal criterion as to when the instructions have been learned. Because the McCarron-Dial is not a work sample system per se, this aspect is not applicable.
- d. **Providing Assistance to Client** - The evaluator is to make certain that the client fully understands the instructions for each task; no assistance beyond that specified by the test manuals can be given during formal testing.
- e. **Repeating Work Samples** - All factors may be repeated as necessary if the evaluator questions the accuracy of the results. However, re-administration of many of the assessments depends upon the instructions in their individual manuals.

6. Scoring and Norms

- a. **Timing** - The evaluator times the client on many tasks; some parts of the McCarron-Dial are not timed.

- b. **Timing Interval** - The tasks that are timed generally involve counting the number of responses or accurate observation for a specified number of seconds.
- c. **Time Norms** - Separate time norms are given for four of the MAND subtests. The remainder of the tasks involve the combination of time and quality scores to form a single raw score or a performance score.
- d. **Error Scoring** - The quality of performance is compared to a well defined set of standards.
- e. **Scoring Aids** - No scoring aids are used.
- f. **Quality Norms** - See "c. Time Norms" above.
- g. **Emphasis in Scoring** - The system emphasizes the quality and quantity of performance.

7. Observation of Clients

- a. **Work Performance** - Work performance factors are identified in various rating scales (BRS, SFAB), in the SSSQ, and in the interpretive guidelines provided in the system manual.
- b. **Work Behaviors** - Work behaviors, as well as personal-social adjustment behaviors, are clearly specified and many specific work behaviors are listed. Most behaviors are defined in observable behavioral terms.
- c. **Recording System** - Three-point and five-point Likert-type scales are used to rate behaviors or performance factors.
- d. **Frequency of Observation** - The OEI (or OEI-R) requires a standard two hour observation period conducted each of five days. The SFAB and EBC may be rated from observations during the formal testing period.

8. Reporting

- a. **Forms** - Standardized forms are included for each of the assessment instruments. Summary forms including an Individual Evaluation Profile (IEP) and an Individual Program Plan (IPP) are also included. The process for scoring and interpretation is clearly detailed in the system manual.
- b. **Final Report Format** - The standard format for comprehensive reporting includes specific scores (raw scores, MDS T-scores and standard scores); vocational and residential placement scores; behavioral observations; case history information; lists of strengths and deficits; programming priorities; and programming recommendations. The forms which may be used for report development are the Individual Evaluation Profile (IEP) and the Individual Program Plan (IPP). The IEP allows the user to record and profile the total score for each test administered. A software program, Computer Assessment Program (CAP), will do this automatically. The IPP allows for entry of subtest scores and right/left measures. These scores are then profiled for each of the factors; space is available to include results from other tests and work samples; strengths and weaknesses; program goals and objectives; and

descriptive or narrative information. This reporting format has also been computerized by a software program, Individualized Trait Analysis for Program Planning (ITAPP). Both the IEP and IPP (as well as the corresponding computer programs, CAP and ITAPP) include profile graphs which visually summarize all scores and compare them to the general population mean, special population mean, the individual's mean, and the vocational program standard or T-score range.

Supplementary computer reports and profiles are available from the SSSQ Computer Report and the Remedial Motor Training Program (RMT). These reports also contain information regarding suggested curriculum and/or strategies of intervention for specific deficits.

9. Utility

- a. Vocational Exploration - The formalized assessment procedures required for the first three factors offer almost no opportunity for client vocational exploration. The observation period either in a sheltered workshop or on a job site could provide chances for exploration, but this depends on the program of each facility. However, the McCarron-Dial Occupational Exploration System (OES) generates a computerized list of DOT-coded occupations based on an analysis of the evaluatee's factor scores obtained from the MDS and WRAT standard scores. The selected occupations are listed in the OES report by Worker Trait Group/Occupational Aptitude Profile number, DOT number and job title. Vocational exploration based on the OES job listing is encouraged by the system. The OES can be used as an extension of the CAP or ITAPP or may be used as a stand-alone program.
- b. Vocational Recommendations - Emphasis is on educational and vocational programming, development and placement. Based on significant research findings, the system predicts the level of vocational and residential functioning the individual may achieve after training. This enables the client and counselor to determine realistic goals and/or appropriate placement. The predicted vocational levels include 4 levels of community employment (transitional, semi-skilled, skilled and technical/professional) and 4 levels of sheltered employment (daycare, work activities, low extended and high extended). The residential levels include community living, halfway house, group home, intermediate care and institutional. Examples of final reports for work, educational and clinical uses are provided in the various manuals.
- c. Counselor Utilization - The predicted vocational level provided by the MDS can be used by the counselor to establish realistic vocational goals and/or appropriate vocational program placement. The detailed profiling of performance across five areas of behavior provides the counselor with a holistic view of the individual's strengths and needs when compared to others in his/her predicted vocational range as well as general population. Specific needs which must be remediated and/or accommodated for successful goal achievement are easily identified. The counselor(s) can then address these specific needs in an individualized program plan.

10. Training in the System

- a. Training Required - A commitment to pursue training is a purchase prerequisite.

- b. **Training Available** - Basic training is available in work evaluation and neuropsychological uses of the MDS. Workshops are held where need indicates as well as in Dallas, Texas at the MDS administrative office. Advanced training is also available on a periodic basis.
- c. **Duration** - Each Basic workshop session takes three days.
- d. **Follow-up** - Advanced training, although not required, is recommended by the developer for maximum use of the system.

11. Technical Considerations

- a. **Norm Base** - Norms for the WAIS, Stanford-Binet, PPVT, MAND and HVDT involve 2,000 or more observations each. Norms for the PMT, OEI, OEI-R, BRS, SFAB, PMT and SSSQ have been obtained on more than 500 normal and disabled adults each. The original normative sample for the entire system as well as the HMMT in work evaluation was 200. Additional samples have extended this number considerably. Profile revisions occur periodically to reflect additional norms. Adult norms on the deaf, blind and aged populations are now available on the HVDT, HMMT and MAND. Pertinent empirical and statistical characteristics of the various norm groups are given in the manuals and in research publications.
- b. **Reliability** - The results of several reliability studies are presented in the various manuals. Experimental methods are for the most part clearly described. Most data are presented in terms of test-retest reliability coefficients and standard error of measurements. All reliability estimates, except the PPVT, are in the high .80's and .90's.
- c. **Validity** - A variety of validity data are presented for separate parts of the system as well as for the entire system. The data presented covers mostly construct and predictive validity. The MDS has been subjected to several studies (see references) which have demonstrated its usefulness as a diagnostic instrument.

12. Reviewer's Summary and Comments

The McCarron-Dial system was initially designed for determining the overall functioning level of mentally retarded and/or mentally disabled persons. Since that time the system's usefulness has been extended to many other populations. The McCarron-Dial should not be considered as a work sample system; rather, it should be thought of as a series of tests and observations that appear to be closely related to clinical psychology. The system uses a combination of widely accepted individually administered psychological tests and other assessments, a determination of fine and gross motor ability and a period of behavior observation. In this way, the MDS depends on several different assessment methodologies. The major feature and the main advantage of the McCarron-Dial is the combining of several different types of assessment tools into a single report that provides a comprehensive picture of the client. In addition to merely reporting results, the MDS provides diagnostic information on some of the factors.

The system contains excellent norms and adequate reliability data. However, the real achievement is the continuing validation research that cannot be equaled by other evaluation or assessment systems.

13. Address

McCarron-Dial Systems
P.O. Box 45628
Dallas, TX 75245
214/247-5945

14. Cost

Basic McCarron-Dial System \$1450.00
Auxiliary Component
HVDT
MAND

Supplemental Instruments
SSSQ \$185.00
PMT \$245.00
HMMT \$625.00
MAND Adaptations for the Visually Impaired \$ 37.75

Software Programs
Computerized Assessment Program (CAP). \$ 775.00
Individualized Trait Analysis for Program Planning (ITAPP). \$1250.00
Occupational Exploration System (OES). \$ 775.00
Remedial Motor Training (RMT). \$ 250.00
SSSQ Computer Report \$ 225.00

Manuals are included in the kits but may also be purchased separately.

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Microcomputer Evaluation and Screening Assessment

(MESA)

1. Development

- a. Sponsor - The MESA was designed, developed and marketed by the Valpar Corporation of Tucson, Arizona.
- b. Target Group - MESA is a screening device to be used with the middle 80% of the population. If a person is either in the top 10% or the lower 10% of the population, they should be referred elsewhere for other types of assessment and/or vocational evaluation. Thus, the system has application to many groups: high school students, a general vocational rehabilitation population, vocational-technical students, prisoners, and manpower trainees. Finally, there are special instructions for persons with hearing losses.
- c. Basis of the System - The system is intended to produce a Worker Trait Profile (called the Worker Qualifications Profile in the third edition of the DOT) for the client or student. Therefore, MESA concepts are derived from the U.S. Department of Labor worker trait definitions and job analysis concepts. Individual scores on the tests and other methods of data collection are weighted and combined to produce a Worker Trait Profile for the client that is compared to performance requirements for desired training or employment.

2. Organization

- a. Name and Number of Work Samples - The MESA consists of nine major test categories:
 - (1) Hardware Screening - Includes Gross Skills, Problem Solving and Fine Skills, each of which contain several measures.
 - (2) Physical Capacities and Mobility Evaluation - Contains: Dynamic Strength and Mobility Evaluation.
 - (3) Vocational Interest Screening - Contains: slide-tape presentation and paper-pencil exercise.
 - (4) Vocational Awareness Screening - Assesses client's knowledge of world of work.
 - (5) Independent Perceptual Screening Assessment - Measures: tactual feeling, form perception, and spatial aptitude.
 - (6) Talking/Persuasive Screening - Short observation of speaking and listening skills.
 - (7) Working Conditions - Environmental preferences.
 - (8) Specific Vocational Preparation - Amount of time to be spent in training.
 - (9) Computer Screening Exercises - Includes 13 subtests: Vision Screening; Placing and Tracking; Color Discrimination; Reading; Size and Shape Discrimination; Short-Term Visual Memory; Spelling, Vocabulary and Mathematics; Language Development; Problem Solving; Hand-Eye-Foot Coordination; and Reasoning Ability. (The Reading, Spelling, Vocabulary and Mathematics tests may be eliminated at the discretion of the evaluator.)

The system collects 84 separate pieces of information (e.g., Placing, Lifting, Tool Usage and Thinking Skills, and Walking Heel-Toe) for each client.

- b. Grouping of Work Samples - The tests are grouped into the nine categories listed above. An alternate classification method is to divide the tests into computer administered, hardware/hands-on and paper-and-pencil tests.
- c. Manual - The MESA manual includes the following headings: Introduction, Criteria Based Assessment, Computer Set-up, Computer Exercises, Other Computer Programs, MESA Subtests, Administration Systems, MESA/DOT, Access Profile Program, Evaluatee Instructions Hardware, Evaluatee Instructions Software, Independent Perceptual Screening, Talking/Persuasive, Physical Capacities/Mobility Evaluation, Vocational Interest, Vocational Awareness, SVP/Working Conditions, Distinguishing Characteristics, Interpreting Results, Technical Information, Bibliography, Appendix, and Mock Reports. There is a separate manual for physical capacities and mobility. The manual covers all test administration, computer set-up and data interpretation. It is very easy to read and understand. The detailed, step-by-step instructions for computer set-up and for administering the hardware/hands-on tests are especially well-written.

3. Physical Aspects

- a. Packaging of the Work Samples - Each paper-and-pencil test is independently packaged. The hardware/hands-on equipment is used for several tests. Finally, the computer administered tests are all contained on floppy disks; not all of these have to be administered.
- b. Durability - Like most Valpar products, the apparatus is well-designed and appears to be durable. The computer equipment is less durable.
- c. Expendable Supplies - The only expendable supplies are paper-and-pencil tests, data recording forms, and paper for the printer.
- d. Replacement - To preserve standardization, all replacement parts must be ordered from the developer.
- e. Computer Requirements - The system will run on Apple II, IIe, and II+ and IBM-PC and IBM-XT with 128 K RAM. The basic computer requirements are: one disk drive, monitor and printer. The MESA adds a control box, hand-control paddle, foot control, eye-hand-foot paddle, MESA control cards and a clock card. Detailed installation instructions are contained in the manual.

4. Work Evaluation Process

- a. Preliminary Screening - There is no preliminary screening for the MESA.
- b. Sequence of Work Sample Administration - The MESA is designed to be administered to from one to four clients at a time. It is recommended to give the Physical Capacities and Mobility Exercise first; then the Hardware Exercise is administered to four clients. The next step is to assign one client to the computer exercises, one to the Independent Perceptual Screening Exercise and two to the Vocational Interest and Vocational Interest Factor Exercise.

The clients are rotated upon completion of these tasks. The final exercise is the Talking/Persuasive Screening Exercise, which is group administered.

- c. Client Involvement - Clients are never really informed of the progress. The only involvement with the evaluator is during the instructions of each work sample. During the Talking/Persuasive Screening Exercise, the evaluator talks to the clients in a group setting. As with most other assessment or screening devices, the goal is to collect a large amount of objective data in a short period of time.
- d. Evaluation Setting - The evaluation setting is intended to create an informal testing situation.
- e. Time to Complete the Entire System - MESA can be given to between one and four people in four hours.

5. Administration

- a. Procedures - All procedures are defined and clearly stated. The manual also states the materials needed, purpose, set-up, administration, scoring and data interpretation.
- b. Method of Instruction Giving - The initial instructions for each test are verbal. The Hardware Section also used posters as visual aids. Evaluator demonstrations are also given. The computer administered tests are largely self-administered. Although reading is required for some of the paper-and-pencil tests, it is estimated that most items are written at the fourth grade level.
- c. Separation of Learning/Performance - Each work sample has a practice exercise before the timed and/or scored section begins. Although there are no specific criteria to be met, the evaluator is to "walk" the client through the steps to make sure the client understands. Each computer administered test has an extended practice section; "however, the test appears on the screen without an introduction." There is little separation of learning from performance.
- d. Providing Assistance to Client - The evaluator is to assist the client with additional instructions and/or demonstrations until the client understands the procedures. Allowances are made for at least two practice sessions.
- e. Repeating Work Samples - the manual states that at the completion of testing, the MESA Summary Report should determine if retesting or additional testing is appropriate. It does not give specific reasons for retesting.

6. Scoring and Norms

- a. Timing - The computer is self-timing and records the client's times. Computerized tests have time limits for both individual items and the total test. Within each test, the client begins with easy items and progresses to more difficult items; the test is concluded when more than a specified number of items are missed. For example, the computer administered academic tests are discontinued after three incorrect responses are made. The hardware/hands-on section is timed by the evaluator. The rest of the tests are not timed.

All test results are entered into the computer for scoring and report preparation.

- b. **Timing Interval** - There is no separate timing interval for the computer administered tests. All hardware/hands-on tests, with the exception of Individual Response Screening, are timed from the end of the practice session to completion. The GOE and Vocational Awareness are timed based on the slide presentation. Finally, the academic tests can be given without time limits, if desired.
- c. **Time Norms** - No time norms are used.
- d. **Error Scoring** - Errors are not scored; on most exercises only correct responses are counted. Separate data recording forms are used for each section to score the number of correct responses, tasks completed, etc. are entered into the computer by the evaluator. All scoring criteria are clearly defined.
- e. **Scoring Aids** - None are used.
- f. **Quality Norms** - This is not relevant.
- g. **Emphasis in Scoring** - The emphasis is on the number of correct responses. In the computer administered tests the number and the pattern of correct responses and errors are also recorded. "The Spelling, Vocabulary and Mathematics exercises are scored in a different manner than the other computer exercises in MESA. In these exercises, points are awarded for choosing the correct response on the first attempt, with fewer points being awarded to correct second choices."

7. Observation of Clients

- a. **Work Performance** -
 - b. **Work Behaviors** -
- } Specific work performance and work behaviors are not used in the MESA.
- c. **Recording System** - The system does not emphasize the systematic recording of behavior observations as defined within the context of this publication. However, the Talking/Persuasive exercise, some of the hardware tests, and the physical capacities test are scored from the observations of the evaluator.
 - d. **Frequency of Observation** - The manual states that the evaluator can observe behaviors all through test administration, but it does give any information on how often to record them.

8. Reporting

- a. **Forms** - MESA uses a variety of forms for recording test results and evaluator's ratings on many of the apparatus tests. All forms are well-designed and appear easy to use. The computer exercises are recorded directly into the computer. All these data are entered into the computer and stored on the clients' disk.

A client's results can be compared to actual jobs, training programs and specific classes by use of the Access Profile. The employer, teacher etc.

rates each trait in the Worker Trait Profile. These profiles are electronically matched against the client's profile.

- b. Format - The MESA user has the option of selecting four computer generated reports: Evaluation Summary Report, Worker Qualifications Profile, Analysis, Screening Access Profile Report and Comprehensive Access Profile Report. The Evaluation Summary Report contains the following headings: Employment/Academic Background, Academic Skills, Perceptual/Neurological (with subheadings for Visual Screening, Color Discrimination, Size and Shape Discrimination, Eye-Hand-Foot Coordination, Eye-Hand Coordination, Physical Capacities, Strength, Mobility, Fine Finger Dexterity, and Manual Dexterity) General Abilities (includes: Problem Solving, Visual Memory, Reasoning, Talking/Persuasive Exercise, Independent Perceptual Screening and Instruction Following), Vocational Awareness, Vocational Interests (GOE and Vocational Interest Factors). The report is computer generated and gives the client scores and allows room for comments and a summary.

9. Utility

- a. Vocational Exploration - Because of the abstract nature of the tests and "work samples," MESA offers almost no vocational information directly to the client.
- b. Vocational Recommendations - The Evaluation Summary Report contains specific testing results. The evaluator uses these results to prepare specific vocational recommendations.
- c. Counselor Utilization - The most powerful use of MESA results is to compare the client's Worker Trait Profile directly to jobs and/or training programs either using data obtained from the Access Profile or from entering the client's profile into a job matching program, such as ValSEARCH (Botterbusch, 1986).

10. Training in the System

- a. Training Required - Training is not required but is highly recommended.
- b. Training Available - Training and certification are available through Valpar regional offices on a regular basis. Special training can be set up at a facility or school if desired. Training and certification are available at the annual Valpar National Training Institute.
- c. Duration - Both MESA training and certification are two-day sessions at \$250.00 per day per trainer, plus expenses. Most training sessions are designed to accommodate 10 to 15 participants at \$50.00 to \$75.00 per day, depending on trainer expenses.
- d. Follow-up - Advanced MESA training sessions are available at the same fee structure given above. The Valpar home office, regional offices and other certified valpar trainers are available for either telephone (800 number) or letter support.

11. Technical Considerations

- a. Norm Base - MESA was normed on 491 male and female students and employed workers in Arizona. The students ranged in age from 10 to 33, i.e., fourth grade to junior college. Workers ranged in age from 20 to 55; they were employed in semi-skilled, skilled, clerical and professional jobs. The manual contains no information on the sample selection, methods used and some of the sample characteristics are not given. Method-Times-Measurement norms were also used.

The MESA Statistical Information Report contains testing results for a group of learning disabled persons, honor society students and, more important, on a group of 3881 subjects. Most of the sample characteristics are provided.

- b. Reliability - The manual contains one test-retest reliability study for 22 of the tests over a one month period. The reliabilities ranged from .79 to .96. Although these appear adequate, there is no information as to sample size, testing conditions, etc. Thus, any interpretation of these results must be tentative.
- c. Validity - MESA developers took several approaches to "validate" the system. Some of these developments centered on a criterion-referenced validity approach. MESA tests and exercises were related by expert judges to the ratings on the scales that make up the Worker Trait Profile. The manual reports high agreement on these ratings. The Report also contains data on "construct" and "criterion" validity. A series of 17 tables "present the correlation of the MESA subtests to each of the 17 factor scores in the Worker Qualifications Profile." No explanation is given on the development of these data, nor are any suggestions offered on interpretation. The bulk of the criterion related validity section presents "data on how MESA scores on specific factors of the Worker Qualifications Profile compared to the scores on those same factors in the JOB BANK 12,375." Although interesting, it is hard to interpret these results as criterion related validity.

12. Reviewer's Summary and Comments

The MESA is designed to provide a vocational assessment of four persons in four hours and to provide accurate assessment for the middle 80% of the population. To the developers' credit the system does not claim to be all things to all people. The manual relates MESA limitations to the need for a more comprehensive vocational evaluation. The system has a definite place in schools, manpower programs and other programs where a quick, yet comprehensive assessment is needed. Because the results are given using the Worker Qualification Profile (i.e., Worker Trait Profile), they can be easily used for input into most computerized job matching systems. Another advantage of this profile is that evaluators familiar with DOL concepts will be able to interpret MESA results with additional training.

As with other Valpar products, the hardware is designed for ease of administration and scoring; given proper care, it should last a long time. The computer administered tests, however, do present some problems. This reviewer has heard some complaints about computer set-up during the last few years. Most of these problems have been corrected.

The major concerns with the system are technical. The manual presents a single reliability study almost without any explanation. While these results appear adequate, additional reliability studies need to be performed.

Validation presents a serious problem. MESA's major validation is to compare results with DOT variable statistics and final scores on the test-generated Worker Qualification Profile. The two manuals contain no studies where the MESA was validated against an outside criteria such as prediction of training or job success. In addition, given the developers' emphasis on construct validity, no factor analysis results or correlations with other tests, work samples, etc. for the various subtests are reported.

To end this review on a positive note, the system's use of the Access Profile to obtain data about local jobs and/or training programs is a good step. The inclusion of this process should make users realize that the most powerful use of a system is in its ability to predict success in real local jobs and training programs.

13. Address

Valpar International Corp.
P.O. Box 5767
Tucson, Arizona 85703-5767

14. Cost

The MESA is available both with and without a computer. The hardware can be purchased to test 1, 2, or 4 persons at a time.

A. With computer

Apple, 64 K RAM, 2 disk drives, color monitor, printer

4 station	\$10,100.00
2 station	\$8,325.00
1 station	\$7,325.00

IBM-PC, 128 K RAM, 2 disk drives, color monitor, printer

4 station	\$11,700.00
2 station	\$9,925.00
1 station	\$8,925.00

B. Without computer (specify Apple or IBM)

4 station	\$6,750.00
2 station	\$4,975.00
1 station	\$3,975.00

15. References

Fry, R. (1984). MESA (Microcomputer Evaluation and Screening Instrument). Vocational Evaluation and Work Adjustment Bulletin, 17(2), 67-70.

Microcomputer Evaluation of Career Areas

(MECA)

I. Development

- a. Sponsor - The system was developed by Mr. Terry Schmitz of the Conover Company; some materials were developed by the Special School District of St. Louis County, Missouri.
- b. Target Group - The manual and other literature clearly state that MECA was designed only for use in schools. The system provides occupational exploration experiences for junior and senior high schools. Within this general target group, MECA focuses on disadvantaged and special needs students.
- c. Basis of the System - The following quote is taken from introductory materials on MECA: "Each career kit in the MECA system was developed on the multiple-trait factor approach to assessment; that is, during the assessment process, several trait factors are assessed at one time. This approach is sometimes referred to as a job sample approach to assessment. These trait factors are keys to a specific job title which interfaces with a major career interest area within one of the sixty-six worker trait groups (sic) of The Dictionary of Occupational Titles."

2. Organization

- a. Name and Number of Work Samples - The system presently contains 15 work samples. Each sample consists of three tasks (called "work samples" by the developer). The work samples and their component tasks are as follows:
 - (1) Automotive - Repairs a wheel cylinder, replaces points and a condenser, and adjusts points.
 - (2) Building Maintenance - Repairs a faucet, prepares electrical cable, and installs new electrical cable.
 - (3) Cosmetology - Gives a manicure, curls long hair, and gives a facial.
 - (4) Graphic Design - Uses a lettering guide, uses transfer lettering, and operates an air brush.
 - (5) Custodial Housekeeping - Dust mops a floor, cleans windows, and cleans furniture.
 - (6) Electronics - Checks electronic circuits, wires a circuit board, and solders resistors on a circuit board.
 - (7) Small Engines - Services the air cleaner, services the ignition system, and cleans the cooling system.
 - (8) Food Service - Sets a restaurant cover, takes orders, and prepares food.
 - (9) Health Care - Wraps an arm with an elastic bandage, and determines temperature, pulse and blood pressure.
 - (10) Business and Office - Files, takes messages, and types a letter.
 - (11) Manufacturing - Sorts and packages, assembles note pads, and assembles using exploded view drawings.
 - (12) Distribution - Fills customers' orders, ships customers' orders, and sets up a display.

- (13) Construction - Makes a butt joint, makes a miter joint, and installs a lock assembly.
- (14) Horticulture - Plants seeds, mixes high porosity soil, and tests soil.
- (15) Computers - Data entry, travel agent, and computer operator.

In addition, each of the 15 work samples has two supplementary exercises. The Learning Activity Packet contains mathematics, reading and other exercises specifically related to the contents of the work sample. For example, the Small Engines contains the following exercises: Name the Part, Small Engine Mathematics, Read It Right, Small Engine Ignition System, Electromath, Small Engines Test, Small Engine Cooling System, and More Small Engine Math. The Math on the Job⁷ contains exercises relating arithmetic to job experiences.

- b. Grouping of Work Samples - Each work sample is independent.
- c. Manual - There is a separate manual for each work sample; each uses the same format and each contains identical sections on general topics such as job classifications, use of the microcomputer, and administration. Each manual contains the following sections: Introduction, Work Sample Descriptions, Academic Reinforcement Descriptions, Job Classifications, Administration - Use of the Microcomputer, Administration - General Information, Administration-Work Samples, Administration - Academic Reinforcement, Administration-Management System, Interpretation of Results, Definition of Terms, Reproducible Forms, Order Form, and Appendix. Each manual is very complete and contains full system details. For example, the narration for each "frame" of the computer-administered instructions is given. All tools and materials are clearly described.

3. Physical Aspects

- a. Packaging of the Work Samples - Each work sample is packaged separately in a locked fiber board and metal box.
- b. Durability - The computer software is the most sensitive part of the system; Conover has a free replacement policy for all damaged software. Most other equipment appears durable.
- c. Expendable Supplies - Each work sample requires a variety of expendable supplies. For example, the horticulture work sample requires: paper towels, soil test kit, peat moss, sand, vermiculite, lime, gypsum, superphosphate, magnesium sulfate, trace elements mix, seed starting soil, marigold seeds, soil mix and a grease pencil. The developer estimates the average cost of expendable items for all 15 work samples per student to be less than \$8.00.
- d. Replacement - All supplies can be ordered from Conover; an order form is included in each manual. Some expendable supplies are locally available.
- e. Computer Requirements - Each work sample is administered on an Apple II+, IIe or IIC computer with at least 48 K RAM, one disk drive, and a monitor.

⁷ The Math on the Job series was developed by the National Center for Research in Vocational Education of the Ohio State University.

Although any monitor will operate, a color monitor is recommended. All software is contained on self-booting floppy disks. If audio administration is desired, a cassette tape recorder with a remote jack is needed. The link between the computer and tape recorder is a Cassette Control Device developed by Hartley Courseware.

4. Vocational Evaluation Process

- a. Preliminary Screening - This is one of the few topics not covered in the manuals.
- b. Sequence of Work Sample Administration - Because each work sample is independent, this section is not applicable for MECA.
- c. Client Involvement - The client is involved in most of the work sample process. Through the use of another Conover product, the Career Planning System (CPS), the client selects occupational areas for further exploration. Within each separate MECA work sample, the client rates his/her interest and performance on each section of the work sample. Finally, the CPS can be used to relate work sample results to educational planning.
- d. Evaluation Setting - Because the MECA is designed specifically for schools, a classroom atmosphere is assumed.
- e. Time to Complete the Entire System - This reviewer estimates that the three tasks in each work sample can be completed in about two hours. If the Learning Activity Packets are used, this time would be extended by about another hour.

5. Administration

- a. Procedures - All materials are clearly specified; photographs are used to insure proper set-up. The Learning Activity Packets and the Math on the Job series are optional programs, administered at the discretion of the evaluator. Individual Learning Activity Packets can be administered; these act as both a test and a review of the work sample.
- b. Method of Instruction Giving - Although there are two different methods, both are dependent on the computer. Prior to the start of computer instructions, the evaluator gives a brief introduction. In both methods all visual instructions are contained on graphic illustrations displayed on the computer monitor. In the first method, written instructions are displayed below each "frame"; these instructions are written at about the fourth grade level. A second method is available for non-readers. Here a cassette audio tape, containing instructions identical to the written instructions, is synchronized through the use of the Cassette Control Device. There are also numerous evaluator check points; these could provide a method of additional instruction.

The Learning Activity Packet is computer administered and scored. The Math on the Job module is self-administered using a workbook approach.

- c. **Separation of Learning/Performance** - Because the work samples do not contain any practice trials or specific criteria to be reached, there is no separation of learning and performance.
 - d. **Providing Assistance to the Client** - There are several evaluator check points in each task. Although intended primarily for error scoring, they could also be used to provide needed assistance.
 - e. **Repeating Work Samples** - This is one of the few topics not covered in the manual.
6. **Scoring and Norms**
- a. **Timing** - The evaluator times the student.
 - b. **Timing Interval** - Separate times are taken for each task. Timing usually begins when the student "sits down and starts performing on this work sample.... The completion of timing is at the end of the work sample."
 - c. **Time Norms** - Time standards are given in ranges (e.g., "17-21 minutes"); these are converted to a five point rating scale.
 - d. **Error Scoring** - At each evaluator checkpoint, the number of "major" and "minor" errors are recorded. These errors are clearly defined in the manual. One point is deducted for minor errors; two for major errors.
 - e. **Scoring Aids** - No scoring aids are used.
 - f. **Quality Norms** - As with time norms, the number of errors on each task are converted to a five point rating scale.
 - g. **Emphasis in Scoring** - Time and quality are given equal weight.
7. **Observation of Clients**
- a. **Work Performance** - MECA identifies and defines 12 "Primary Skill Factors," such as, size discrimination, use of hand tools, and motor coordination. Various combinations of these are to be observed in each work sample.
 - b. **Work Behaviors** - Two separate classes of work behaviors are identified. First, 13 "Secondary Overall Skill Factors" (e.g., ability to follow written instructions, following a model, and care in handling) are observed. As with work performance, different combinations of factors are observed in each work sample. Second, the original MDC Behavior Identification Format (Esser, 1974), which contains 22 separate work behaviors, is used for overall observation.⁸

⁸ This original version of the MDC Behavior Identification Format was developed under federal funding and was not copyrighted. The Conover Company, however, obtained the Materials Development Center's permission to use the Format. There is no commercial relationship between MDC and Conover.

- c. Recording System - The Primary Skill Factors and Secondary Overall Skill Factors are rated on a five point scale. The MDC Behavior Identification Format is rated on a six point scale, with the major ratings being "acceptable," "selective placement," and "change needed."
- d. Frequency of Observation - This is not mentioned in the manual.

8. Reporting

- a. Forms - Two separate forms are used with each work sample. The Interest Reaction Form, completed by the student, contains ratings of interest and ability for each task as well as spaces for recording the results of the Learning Activity Packet. A teachers' or evaluators' form lists the Primary Skill and Secondary Overall Skill Factors relevant for the particular work sample, defines the errors for each task, and contains ratings for time and quality. The other side of this form contains the MDC Behavior Identification Format.
- b. Final Report Format - Although no final report format is suggested by the MECA work samples per se, another Conover product, the Vocational Report Printout, can be used for a final report. The following information is entered: personal and educational data, academic competencies, CPS data, and MECA results. These data are then combined and the resulting report can be used for future vocational planning.

9. Utility

- a. Vocational Exploration - MECA is designed as a vocational exploration system. The system definitely achieves this stated purpose.
- b. Vocational Recommendations - Because the MECA is intended for school systems, vocational recommendations center around planning future educational goals.
- c. Counselor Utilization - The report is designed for the teacher and school guidance counselor.

10. Training in the System

- a. Training Required - Training is not required for purchase.
- b. Training Available - Training is available from Conover and some of its dealers.
- c. Duration - CPS training takes about two hours; MECA training about four hours. The cost for CPS is \$100.00 and MECA is \$250.00; these costs do not include travel expenses.
- d. Follow-up - Follow-up is available from Conover and its dealers.

11. Technical Considerations

- a. Norm Base - No norms or predetermined time standards are given or even mentioned in the manuals.

b. Reliability - No information available.

c. Validity - No information available

12. Reviewer's Summary and Comments

The MECA is a series of 15 work samples designed for vocational exploration; the target population is school populations. MECA kits are very well designed, include durable tools and equipment, and are priced much lower than most other occupational exploration orientated work samples. The use of computer technology allows for instruction using well-designed graphics, reading from the computer screen, and if needed, audio cassette. These computer given instructions are the heart of the system, as well as the reason for comparatively low per unit costs. The system also features closely related software and print media that relate arithmetic and reading comprehension to the specific work sample.

The system's main flaw is the complete lack of norms, reliability, and validity. While it may be too much to expect empirical validity from an essentially occupational exploration device, the developer needs to obtain normative data to determine test-retest reliability, and to include information on content validity for each work sample. Such information should relate each task within each work sample to similar or identical tasks required on specific jobs.

13. Address

The Conover Company
P.O Box 155
Omro, Wisconsin 54963

14. Cost

There are two separate purchase options for purchasing individual work samples:

A. Software and administration manual for each work sample. \$250.00
(per work sample)

B. Complete Work Sample - includes software (3 task disks and Learning Activity Packet), administration manual, related Math on the Job, hardware, hand tools and supplies in a package case:

Automobile.	\$550.00
Building Maintenance.	\$550.00
Graphic Design.	\$550.00
Cosmetology	\$550.00
Custodial Housekeeping.	\$550.00
Electronics.	\$595.00
Small engines.	\$725.00
Food Service.	\$550.00
Business and Office.	\$450.00
Health Care.	\$450.00
Manufacturing.	\$550.00
Construction.	\$595.00
Distribution.	\$595.00
Horticulture.	\$495.00

Computers	\$350.00
Individual Learning Activity Packets.	\$69.95
Cassette Control Device	\$79.95

15. References

None presently available.

Micro-TOWER

1. Development

- a. Sponsor - The system was developed by the ICD - International Center for the Disabled. However, support was obtained from the HEW Rehabilitation Services Administration to collect normative data.
- b. Target Group - The system was primarily aimed at a general rehabilitation population, but it can also be used with special education students, the disadvantaged, and adult offenders. It can also be used with learning disabled and higher level mentally retarded adolescents and adults. It is not intended for use with persons who are above average in intelligence.
- c. Basis of the System - The system is basically a group aptitude test that uses work sample methodology to measure seven aptitudes as defined by the fourth edition of the Dictionary of Occupational Titles and the General Aptitude Test Battery (GATB). The statistical basis are studies on the factor analysis of several work samples and concurrent validity studies.

2. Organization

- a. Name and number of Work Samples - The system contains 13 work samples which measure eight specific aptitudes, plus General Learning Ability or G. The work samples are, however, organized into five major groups of what can be thought of as second order factors. The primary aptitude(s) and the DOT/GATB abbreviation for each work sample are given in the parentheses:
 - (1) Motor - Electronic Connector Assembly (F-finger dexterity); Bottle Capping and Packing (M-manual dexterity); and Lamp Assembly (K-motor coordination).
 - (2) Spatial - Blueprint Reading (S-spatial reasoning); and Graphics Illustration (S-spatial reasoning; K-motor coordination).
 - (3) Clerical Perception - Filing (Q-clerical perception; K-motor coordination); Mail Sorting (Q-clerical perception; M-manual dexterity); Zip Coding (Q-clerical perception); and Record Checking (Q-clerical perception).
 - (4) Numerical - Making Change (N-numerical reasoning); and Payroll Computation (N-numerical reasoning).
 - (5) Verbal - Want Ads Comprehensions (V-verbal comprehension); and Message Taking (V-verbal comprehension).

It must be noted that four work samples (Want Ads Comprehension, Zip Coding, Blueprint Reading, and Payroll Computation) have alternate forms to prevent cheating during administration and for possible use during retesting.

- b. Grouping of Work Samples - The work samples are grouped according to the five aptitude areas listed above.
- c. Manual - The system contains several manuals. A general administration and scoring manual, a manual for the group discussion program, a separate manual for each work sample, and a technical manual. Each of 13 work sample manuals contains the following: description, materials, setup, administration, scoring, and sample forms. All manuals are well written and detailed.

3. Physical Aspects

- a. Packaging of the Work Samples - All work samples are individually packaged; no parts are used by more than one work sample.
- b. Durability - The hardware is durable and because the system uses little complex equipment, minimal equipment replacement can be expected.
- c. Expendable Supplies - Wire in the Lamp Assembly Work Sample and the various paper forms are the only expendable supplies.
- d. Replacement - Forms can be ordered from Micro-TOWER or locally duplicated. The cassette administration tapes must be ordered from the distributor.
- e. Computer Requirements - Not applicable.

4. Work Evaluation Process

- a. Preliminary Screening - No preliminary screening is required prior to the administration of Micro-TOWER. The manual states, however, that a period of general orientation to the system should be given prior to work sample administration.
- b. Sequence of Work Sample Administration - The manual contains several suggested schedules for administration of the work samples and for group discussion. These schedules are only suggestions and the work samples do not have to be given in any set sequence. However, because the Want Ads Comprehension Work Sample tests the ability to read and understand English, it is usually first. Within each work sample a carefully defined sequence is followed and all instructions to the clients are recorded on a cassette tape. The first step is the presentation of a series of occupational photos illustrating jobs requiring the skills assessed by the work sample. Each work sample provides an untimed learning/practice period which includes taped instructions, visual illustrations, evaluator demonstrations, and an opportunity for clients to practice. During this period, the cassette tape automatically stops at preselected places so that the evaluator can give additional instructions, etc. The evaluator is also free to stop the tape at any time if additional help is needed. After this learning/practice period comes the evaluation period. Here clients work entirely on their own without any help. After completion of the task, the clients fill out a self-report from rating their interest and perceived ability.
- c. Client Involvement - Micro-TOWER emphasizes client involvement, which is accomplished in several ways. Prior to administration of the work sample, occupational information is provided; during the instruction period, the evaluator stops at several points to answer questions and provide additional instructions. The greatest client involvement is during the group discussion program. Here client values, interests, needs, etc., are discussed. Suggested activities (e.g., job values, lifelines, choose your supervisor) are provided in a separate manual. Clients also receive formal feedback of their performances on the work samples.
- d. Evaluation Setting - The evaluation setting could best be described as a combination of a formal testing situation and a group counseling environment.

The Micro-TOWER is best administered in a room that is separate from the rest of the evaluation unit; a "U" shaped table arrangement is suggested. These factors add up to the formal testing atmosphere.

- e. Time to Complete the Entire System - Total testing time is about 15 hours; if group discussions are included, the total evaluation takes from 19 to 20 hours. Depending on what schedule is used, the battery can be administered in between three and five days. The manual contains several suggested schedules which vary in the number of hours per day that the work samples are administered and in the presence and duration of the group discussion periods.

5. Administration

- a. Procedures - General administration procedures are described in the overall manual. The specific manual on each work sample contains detailed instructions on materials, layout, administration, scoring criteria, etc. All procedures are given in great detail.
- b. Method of Instruction Giving - Instructions are given by several methods. Each work sample begins with a series of large photographs showing jobs requiring skills related to the work sample. The major instructional method, however, is a separate audiocassette tape for each work sample which is coordinated with evaluator's demonstrations. This tape is programmed to stop at certain critical points so that the evaluator can provide help, give additional explanations, or check the results of the practice exercises. The system emphasizes standardized instructions and timing and uses the audiotape as the major means of insuring this standardization. No written instructional materials are used. However, to complete some of the verbal and clerical tasks, a third to fourth grade reading level is required. In summary, there are five steps in each work sample: (1) occupational orientation, (2) basic instructions, (3) practice period, (4) timed evaluation, and (5) completion of self-evaluation.
- c. Separation of Learning/Performance - The system places a great deal of emphasis on separation of learning from performance. Each work sample contains a practice period during which the clients must reach certain informal criteria. The evaluation period is timed and is only begun once the clients have understood and practiced the task.
- d. Providing Assistance to the Client - Extensive assistance is provided during the learning/practice period. None is given during the actual evaluation period.
- e. Repeating Work Samples - The manual contains no instructions or guidelines for repeating work samples. The only reference to readministration is made in regard to the use of alternate forms for four work samples.

6. Scoring and Norms

- a. Timing - The evaluation period on each work sample is timed using a cassette tape. The tape tells the clients to "begin," then runs through a number of minutes of blank tape and then tells the client to "stop." This procedure insures accurate timing.

- b. **Timing Interval** - Timing is for a specified period within each work sample. Clients do not continue until they have completed the task.
- c. **Time Norms** - No time norms are used in this system. The score for each work sample is the number of correct responses; report forms also provide space for recording the number attempted.
- d. **Error Scoring** - A separate form is used for each work sample to score the number of correct responses, pieces completed, etc. The entire product is scored for each work sample; there are no random checks. The raw scores for each work sample are recorded on the "Summary of Work Sample Performance" sheet. Quality standards are carefully defined.
- e. **Scoring Aids** - Some use is made of scoring aids.
- f. **Quality Norms** - The raw scores for each work sample are compared to the desired norm group. A scale is used to convert the scores into one of five possible ratings. These ratings are based on percentile norms (which are given in the technical manual), one rating for each 20 percentile points. Thus, a very high rating means that the client scored above the 81st percentile. Norms for 19 different groups as well as MODAPT industrial standards are available.
- g. **Emphasis in Scoring** - The emphasis is on the quality of work produced within a specified time period.

7. Observation of Clients

- a. **Work Performance** - No specific work performance factors are defined in the manual or listed on the "Behavioral Observations" form. For each work sample there is a space for the evaluator to record general comments; there are no suggestions in the manual as to what these should cover.
- b. **Work Behaviors** - Five work behaviors (i.e., understanding instructions, attention span, work attitude/motivation, need for individualized help, and efficiency) are listed on the "Behavior Observations" form; these are not defined in behavioral terms. This form also includes a section on "general behavior" containing items like appearance, physical problems and self-image. The evaluator is to make short notes for all of the "behaviors" listed on this form.
- c. **Recording System** - No rating system is used for any of the items on the "Behavioral Observations" form. However, a six-point scale is used for general and work behaviors on the Summary Report Form.
- d. **Frequency of Observation** - Observations are to be made during the training phase, during the performance of the work sample, and during group discussion. While no schedule for frequency is specified, it would appear that frequent observations are expected.

8. Reporting

- a. **Forms** - The Micro-TOWER uses a variety of forms. This includes a raw score form for each work sample, the "Behavioral Observations" form men-

tioned above, a "Summary of Work Sample Performance" form, an attendance form, as well as reporting forms. The client completes a "Client Interest and Perceived Performance" form after the completion of each work sample; there is also a summary sheet for this form.

- b. Final Report Format - There are three forms used for reporting. The first is a profile sheet based on percentiles that gives the client's results on each work sample on a scale from "much below average" to "much above average." The second is a narrative summary report format which may or may not include the forms mentioned under 7. a. Finally, there is a "Recommendations" form which uses a checklist format to cover topics such as special training, individual attention, and vocational recommendations.

9. Utility

- a. Vocational Exploration - The information given at the beginning of each work sample is designed to make clients aware of what jobs are related to the aptitude(s) being measured by the work sample. Many of the topics covered in the group discussions center on relating personal needs to job demands and occupational interests.
- b. Vocational Recommendations - The system relates aptitudes to Worker Trait Groups that require aptitude patterns similar to those of the client. Thus, in making recommendations, the evaluator would match client's aptitudes with those required by the Worker Trait Groups. This process would be further broken down according to interests, interpretations from behavior observations, and the results of group discussions. These recommendations would be written in narrative form in the narrative summary report.
- c. Counselor Utilization - the Micro-TOWER has two major uses. The first is to present a relatively accurate assessment of job related aptitudes in a fairly brief period of time. The second is to be a first or screening step in an extended period of evaluation. ICD, for example, uses the Micro-TOWER as a preliminary to more extensive evaluation systems.

10. Training in the System

- a. Training Required - Although formal training is not required, it is desirable.
- b. Training Available - On-site training programs are available.
- c. Duration - Two days.
- d. Follow-up - Available.

11. Technical Considerations

- a. Norm Base - Industrial standards through MODAPTS are available. Psychometric norms are available on a total of 19 groups. Some of the major groups are: general agency rehabilitation clients, males, females, Spanish-speaking, left-handed persons, physically disabled, psychiatrically disturbed, brain damaged, cerebral palsied, students in special education, the disadvantaged, recovering drug abusers, recovering alcoholics, and adult offenders. Group sizes range from 40 to 1300. Most sample characteristics are adequate-

ly described. Purchasers of the system can receive help from ICD in developing local norms. No employed worker psychometric norms are used.

- b. Reliability - The Technical Manual provides data on the reliability of the Micro-TOWER work samples. The coefficients range from .74 to .97. The data was based on test-retest, alternate forms, and internal consistency estimates. These estimates are adequate.
- c. Validity - Although a factor analysis revealed a large general factor, there was also evidence for grouping the work samples into the five aptitude areas. The construct validity of the work sample battery is supported by examination of the intercorrelations of the Micro-TOWER work samples. Correlations are also available with the factors from the General Aptitude Test Battery (GATB). All data are reported in the Technical Manual. One study providing positive evidence of Micro-TOWER's use in decision-making compared the recommendations made after four additional weeks in TOWER. There was a 74% agreement on vocational recommendations, suggesting that decisions can be reached in a much shorter time for many individuals (Reinert & Loeding, 1978).

12. Reviewer's Summary and Comments

Micro-TOWER may best be described as a group aptitude battery that uses work sampling techniques as the assessment method. The system claims to measure seven of the nine aptitudes that are used in the DOT. The system has the advantage of being group administered in a fairly short period of time, thus making maximum use of evaluator time. The system attempts to go beyond the mere assessment of aptitudes by providing occupational information and group discussion. Adequate norms are available, except for employed workers. The system generally takes a standardized, psychological test approach with emphasis on carefully controlled administration conditions, the separation of learning from performance, and the reporting of results in terms of percentiles. One major problem with the system is the lack of thorough behavioral observational materials. Another possible problem is the converse of the advantages of a group administered test - the evaluator may not be able to provide the client with the one-to-one relationship that is needed for some severely disabled persons.

13. Address

International Center for the Disabled
Att: Micro-TOWER
340 East 24th Street
New York, New York 10010

14. Cost

The cost of the Micro-TOWER depends primarily upon the number of clients being tested in the group. Each client requires a complete set of equipment. An additional set of equipment is needed for the evaluator. Prices are available for group sizes from 4 to 30, for example:

<u>Number of Persons Tested Per Group</u>	<u>Price</u>
4	\$ 8,737.00
7	9,925.00
10	11,113.00
20	15,073.00
30	19,033.00

The above prices include all equipment, forms to test 100 clients per work sample, one set of evaluator's equipment for each work sample, a cassette playback and a cue-stop system, table easels and photo books.

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Philadelphia Jewish Employment and Vocational Service Work Sample System

(JEVS)

1. Development

- a. **Sponsor** - Originally developed for the Manpower Administration of the U.S. Department of Labor for use in WIN and CEP programs, the JEVS has been refined by the Philadelphia Jewish Employment and Vocational Service.
- b. **Target Group** - Initially designed for the disadvantaged, the system has been used in the last several years as an assessment device for special needs populations.
- c. **Basis of the System** - The present basis is the Work Group system of the fourth edition of the Dictionary of Occupational Titles and the 1979 Guide for Occupational Exploration (GOE). The philosophical basis is a trait-factor approach between common aptitudes and behavioral demands of the Work Groups and work samples.

2. Organization

- a. **Name and Number of Work Samples** - The JEVS contain 28 different work samples. (The purchaser receives a total of 48 separate work samples, 20 of which are duplicates of the most used work samples.) The 28 work samples are referenced to 12 Work Groups. Most of the 28 work samples are used in more than one Group:

- 05.03 - Engineering Technology - Condensing Principle
- 05.05 - Craft Technology - Blouse/Vest Making, Pipe Assembly, Resistor Reading, Nail and Screw Sort, Lock Assembly, Telephone Assembly
- 05.09 - Material Control - Computing Postage, Nail and Screw Sort, Filing by Numbers
- 05.10 - Crafts - Resistor Reading, Telephone Assembly, Metal Square Fabrication, Ladder Assembly, Union Assembly
- 05.12 - Elemental Work Mechanical - Hardware Assembly, Grommet Assembly
- 06.02 - Production Work - Telephone Assembly, Hardware Assembly, Metal Square Fabrication, Grommet Assembly
- 06.03 - Quality Control - Nail and Screw Sort, Collating Leather Samples, Nut Packing, Tile Sorting
- 06.04I - Elemental Work: Industrial - Belt Assembly, Grommet Assembly, Sign Making, Budgette Assembly
- 06.04II - Elemental Work: Industrial - Collating Leather Samples, Nut Packing, Washer Threading, Nut, Bolt and Washer Assembly
- 07.02 - Mathematical Detail - Computing Postage, Payroll Computation, Adding Machine
- 07.03 - Financial Detail - Computing Postage, Payroll Computation, Adding Machine
- 07.05 - Records Processing - Filing by Letters, Proofreading, Filing by Numbers
- 07.07 - Clerical Handling - Filing by Numbers, Rubber Stamping

- b. Grouping of Work Samples - The work samples are organized into 12 Work Groups for reporting and interpretation purposes.
- c. Manual - The Work Sample Evaluator's Handbook contains detailed administration and scoring instructions as well as numerous photographs to illustrate proper setup and common errors. The manual is well written and easy to follow.

3. Physical Aspects

- a. Packaging of the Work Samples - Each work sample is packaged individually; no tools or parts are shared with other samples.
- b. Durability - The system uses common tools and materials that should be very durable. The one exception is the telephone.
- c. Expendable Supplies - In addition to referral, report, and other forms, the major expendable supplies are: fabric, paper pads, sheet metal, and string. While these supplies should be available locally, they can also be purchased from the developer.
- d. Replacement - Most tools and equipment can be locally purchased; other items (e.g., colored chips) are available from the developer.
- e. Computer Requirements - Not applicable.

4. Work Evaluation Process

- a. Preliminary Screening - No preliminary screening is required.
- b. Sequence of Work Sample Administration - The work samples are administered in order of complexity beginning with Nuts, Bolts, and Washer Assembly and ending with Condensing Principle Drawing. If a client is obviously not able to complete the work samples at any one level, more complex work samples are usually not administered.
- c. Client Involvement - A client orientation is given at the beginning of work sampling, a motivational group interview at the end of the first day and a structured Feedback interview at the completion. Since work sample administration resembles realistic work setting, interaction between client and evaluator occurs between work sample administration and during the above sessions.
- d. Evaluation Setting - A realistic work atmosphere and setting are stressed in the manual.
- e. Time to Complete the Entire System - The average client takes six or seven days to complete the 28 work samples.

5. Administration

- a. Procedures - The layout is clearly described and photographs are used to insure proper setup. The materials listed for each work sample are not listed at the beginning of the instructions for that work sample. The evaluator is

provided with a list of materials for each work sample as detailed in the set-up instructions.

- b. Method of Instruction Giving - All instructions are oral and some demonstration. Reading is required of the client only when it is a requirement in the job area being sampled.
- c. Separation of Learning/Performance - Most of the work samples do not have a separate practice period. Typically, the evaluator gives the instructions while providing a demonstration. The client attempts the task without a prior period of practice. There are no set criteria to be met prior to timing. Thus, there is minimal separation of learning from performance.
- d. Providing Assistance to Clients - Assistance can be given after the initial instruction period; but this results in lowering the client's final score. The manual contains detailed procedures for providing assistance and describes three levels of helping. Each level and each type are clearly defined. This emphasis of the analysis of the type of assistance is unique to the JEVS system.
- e. Repeating Work Samples - Readministration is not recommended because it invalidates results.

6. Scoring and Norms

- a. Timing - A time clock is used to stamp the starting and stopping time for each work sample. A separate time stamp slip is used for each work sample.
- b. Timing Interval - The evaluator punches the time clock after instructions are given and the client punches the clock when the work sample is completed.
- c. Time Norms - Time results are rated on a three-point scale based on the number of minutes to completion. The scale is taken from percentile scores.
- d. Error Scoring - Most work samples use a random check of items that are compared to carefully defined scoring criteria; many use photographs to illustrate quality standards. Assistance points are also incorporated into the error scoring procedures.
- e. Scoring Aids - Minimal use is made of scoring aids.
- f. Quality Norms - Quality is rated using a three-point scale based on the number of counted errors.
- g. Emphasis in Scoring - Time and quality are given equal weight.

7. Observation of Clients

- a. Work Performance - Sixteen specific factors (e.g., size discrimination, form perception) and four more general factors (e.g., accuracy, neatness) are specified for the system; each work sample has certain factors listed that are to be observed. The system stresses the recording of accurate behavioral observations.

- b. **Work Behaviors** - The system carefully lists and defines many work related behaviors that are to be carefully observed. For example, in writing observations about communication, articulation, tone of voice and grammatical usage are to be noted. Some other behaviors are cooperativeness with co-workers and supervisors, reaction to criticism, and frustration tolerance.
 - c. **Recording Systems** - Many of the work performance factors are rated on a three-point scale, with all ratings clearly defined and illustrated.
 - d. **Frequency of Observation** - The system uses extensive observations. Observation of defined work factors is required for each work sample; these are summarized daily.
8. **Reporting**
- a. **Forms** - Standardized forms are included for: reporting the results of each work sample, daily observation summary, feedback interview and a final report.
 - b. **Final Report Format** - The well organized standardized format includes some ranking of work sample performance, recommended Work Groups and rationale, and extensive written comments on performance and behavior.
9. **Utility**
- a. **Vocational Exploration** - Client vocational exploration is seriously limited by two factors: (1) many of the work samples tend to be abstract, and (2) there is no orientation relating the work samples to jobs.
 - b. **Vocational Recommendations** - The final report has a space for two Work Groups that are suggested for additional planning. The recommendations are related to the fourth edition of the DOT and the GOE and are geared for both training and job placement.
 - c. **Counselor Utilization** - The system and the final report are oriented toward the counselor; however, counselor familiarity with the DOT and GOE is necessary for optimal counselor use.
10. **Training Required**
- a. **Training Required** - Yes
 - b. **Training Available** - Yes
 - c. **Duration** - One week; usually held in Philadelphia. Regional training is available under certain conditions.
 - d. **Follow-up** - Not available.
11. **Technical Consideration**
- a. **Norm Base** - The system was renormed in 1975 on a total population of over 1,100 clients in 32 facilities throughout the U.S. Time and quality norms are reported for the total sample as well as separate norms by sex, and for

different client groups, vocational rehabilitation, manpower, Goodwill, schools, and special schools for the mentally retarded. The norms are given in the 1-2-3 ratings only; no means, standard deviations or percentile cutoffs are given. Thus, the user has no idea of what the distribution is. Sample characteristics are not adequately described.

- b. Reality - No published data are available.
- c. Validity - Although the initial study of the system gave favorable evidence, results of studies done by the U.S. Department of Labor have not been released to the public. Research by Nadolsky (1973) concludes that the system is valid for evaluation of immediate employment potential. There are no recent data available on validation.

12. Reviewer's Summary and Comments

The JEVS System is a highly standardized and well integrated procedure for client evaluation based on 12 of the Work Groups of the GOE. The strongest points of the system are its stress upon careful observation and accurate recording of work behaviors and performance factors. The use of a trait-and-factor approach ties in well with the assessment of specific abilities. The major problems with the system appear to be the abstract nature of many of the work samples, which hinders vocational exploration and the lack of job information presented to the client. The system is best used when a thorough evaluation of the client's potential is desired.

13. Address

Vocational Research Institute
Jewish Employment and Vocational Service
2100 Arch St. 6th Floor
Philadelphia, Pennsylvania 19103

14. Cost

\$9,980.00 includes all work samples, forms, and tuition for training one person in Philadelphia. The cost of transportation and living expenses for the person to be trained are not included in the price.

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Prep Work Samples

1. Development

- a. Sponsor - The work samples were developed by Prep, Inc, and are one of the four parts of the system originally called the Comprehensive Occupational Assessment and Training System (COATS), (i.e., Job Matching, Employability Attitudes, Work Samples, and Living Skills.)
- b. Target Group - The work samples were originally designed for use with special needs populations. Presently, the work samples are used in secondary, vocational education and alternative educational programs, manpower programs and corrections.
- c. Basis of the System - The work samples are job simulations for aptitude assessment and career exploration. The 15 Career Clusters identified by the U.S. Office of Education were used for development of the Prep Work Samples. These clusters were subdivided into 105 job families and their content is identified through job analysis and data contained in the third edition of the Dictionary of Occupational Titles.

2. Organization

- a. Name and Number of Work Samples - Presently available work samples are:
 - (1) Drafting - Sixteen tasks in architectural and technical drafting.
 - (2) Clerical/Office - Filing systems, procedures and general reference materials.
 - (3) Metal Construction - Lays out, cuts and files, solders, bevels, and threads.
 - (4) Sales - Handles money and totals bills and credit forms.
 - (5) Wood Construction - Try-square, hammering, materials calculation and sawing.
 - (6) Food Preparation - Measures and mixes, calculates recipes and cooks short orders.
 - (7) Medical Services - Determines TPR, determines blood pressure, keeps records and preforms urinalysis.
 - (8) Travel Services - Clerical tasks centering around making airline reservations.
 - (9) Barbering/Cosmetology - Combs and cuts hair, shampoos, and wig use and care.
 - (10) Small Engine - Changes oil, cleans air filter; and tests magneto, spark plug and compression.
 - (11) Masonry - Mixes mortar and lays bricks.
 - (12) Electrical - Wires and mounts a junction box.
 - (13) Police Science - Records information, completes reports and uses proper arrest procedures.
 - (14) Electronics - Installs resistors, attaches wires, and tests circuits.
 - (15) Automotive - Assembles tail light, attaches exhaust pipe and battery connector and rebuilds brake cylinder.
 - (16) Commercial Art - Draws basic shapes and human figures, transfers letters and shapes and lays out an advertisement.

- (17) Nutrition - Selects appropriate foods, checks nutrition and fills out forms.
 - (18) Bookkeeping - Writes invoice and purchase order, operates calculator, corrects errors and transfers figures.
 - (19) Fire Science - Records information, deals with public and selects proper equipment.
 - (20) Extraction Technology - Measures solutions, calculates ppm, fixes oxygen, and cleans equipment.
 - (21) Clothing and Textiles - Marks and cuts fabric, operates a sewing machine, bastes, inspects and folds.
 - (22) Real Estate - Lists and matches buyer's needs, completes a contract and determines costs.
 - (23) Communication Services - Installs a speaker, mounts a transformer and tests equipment.
 - (24) Refrigeration - cuts, reams and solders tubing; connects wires and installs a thermostat.
 - (25) Computer Technology - Loads computer, enters data records, works with variables and writes a computer program.
 - (26) Solar Technology - Assembles a solar panel.
 - (27) Machine Trades - Sets up and operates a lathe; cuts; and performs shop calculations.
- b. Grouping of Work Samples - Each work sample is independent. Work samples are administered and scored individually.
 - c. Manual - The general manual described the theoretical underpinnings and information applicable to all work samples. In addition, a specific manual is provided for each work sample. Detailed instructions, set up procedures, participant prerequisites, evaluation points, and other relevant information are contained in the specific manual. The general manual and the specific manuals are contained in three-ring binders.

3. Physical Aspects

- a. Packaging of Work Samples - Each of the 27 audiovisual work samples is packaged separately in portable containers and can be set up on a sturdy table or carrel. When not in use, the work samples can be easily stored. A single LaBelle projector may be used with several work samples.
- b. Durability - The work samples are durable. Containers are constructed of 3/4 inch birch plywood and formica. Quality tools and equipment from manufacturers such as Black and Decker, Stanley, and Craftsman are provided. The LaBelle audio-visual projector requires minimal maintenance and repairs.
- c. Expendable Supplies - Each work sample uses consumables such as baking items, wood, printed circuit boards, and wigs. Enough consumables are provided for assessing ten clients. Additional packages of consumables are available through Prep, Inc. The average cost of consumables per work sample is \$6.50 per client, if purchased through the manufacturer.
- d. Replacement - With the exception of the Self Rating Forms and Individual Report Forms that must be ordered from Prep, Inc., all expendable supplies can be purchased locally.

- e. Computer Requirements - Not applicable.

4. Work Evaluation Process

- a. Preliminary Screening - No preliminary Screening is required. However, the evaluator should review the prerequisites for each work sample to avoid unnecessary frustration on the part of the client.
- b. Sequence of Work Sample Administration - There is no predetermined administration sequence. Both the order and number of work samples administered are determined by the client and evaluator.
- c. Client Involvement - The client completes a Self Rating Form based on interest, perceived difficulty and level of performance throughout the assessment. At the conclusion of the work sample administration, the evaluator transfers the client's self-ratings to the Individual Record Form, which includes the evaluator's observations. The results of the client's and the evaluator's ratings are reviewed and the client is given a copy of the Individual Report Form.
- d. Evaluation Setting - The majority of the equipment replicates industry. However, since assessment usually takes place in a room with tables, carrels, and audiovisual projectors, a classroom atmosphere prevails.
- e. Time to Complete Entire System - Because the average work sample is completed in two hours, all 27 work samples would take an estimated 54 hours. Average work sample times range from 38 minutes to four hours and 12 minutes. However, in actual use, this many work samples would not be administered. The average client completes from three to five work samples in from six to ten hours.

5. Administration

- a. Procedures - The materials required, layout procedures and evaluation points are clearly described.
- b. Method of Instruction Giving - Instructions are presented with an audiovisual LaBelle format. This format uses an eight track audio tape synchronized with a 16mm filmstrip. Automatic stop pulses are programmed throughout each work sample allowing the client to complete each step and work at his/her own pace.
- c. Separation of Learning/Performance - There is minimal separation of learning/performance. Most client instructions do not require a criteria to be reached before proceeding from the practice period to the performance period. For each task on which the client will be assessed, a demonstration of the task is always given prior to the evaluation point. Many times the client is afforded the opportunity to practice the task first.
- d. Providing Assistance to the Client - If a client is having difficulty with a task, the manual recommends that the evaluator record this difficulty. If the client cannot complete this task, the work should be evaluated as less than acceptable. The evaluator may assist the client with a task if the remainder of the work sample is based upon the successful completion of a task.

- c. Repeating Work Samples - Generally, work samples are not readministered.

6. Scoring and Norms

- a. Timing - Time is usually recorded, but has no bearing on the evaluation except as an indication of severely limited ability.
- b. Timing Intervals - Since timing is not critical to scoring, the client is timed during the entire duration of the work sample. Appropriate stopping points are indicated to allow for short class periods or interruptions.
- c. Time Norms - The evaluator records the total work time on the Individual Report Form. Separate time norms are not used.
- d. Error Scoring - At certain evaluation points during the work sample, results are checked against carefully defined scoring criteria. Each performance is evaluated separately on a five point acceptability scale and an overall rating (i.e., high, medium, and low) is assigned. A rating is also assigned for behavioral observations.
- e. Scoring Aids - Some scoring aids are used. For example, overlays are used for the completed drawings in the Drafting Work Sample and response keys are supplied with each work sample requiring written work.
- f. Quality Norms - The acceptability ratings are based on industrial standards. Performances must be completed with certain tolerances in order to receive acceptable ratings. Exact tolerances are described for each work sample in the specific manuals.
- g. Emphasis in Scoring - The system emphasizes work performance and work behavior ratings. The client's performance time and self-rating are also taken into consideration.

7. Observation of Clients

- a. Work Performance - Work performance factors are not listed.
- b. Work Behaviors - The Individual Report Form lists eight work behaviors which are to be observed and recorded as part of the evaluation. They are: relationship to authority, relationship to co-workers, tolerance for frustration, acceptance of criticism, concern for property, work efficiency, reliability, and appropriateness of appearance.
- c. Recording System - The Individual Report Form describes high, medium and low ratings. A rating is assigned for each work performance and work behavior, and an average is taken for an overall rating.
- d. Frequency of Observation - No predetermined schedule exists. Frequency will vary according to the number of clients being evaluated as well as the frequency of work performance evaluations.

8. Reporting

- a. Forms - Two forms are used: the Self-Rating Form and the Individual Report Form. The Self-Rating Form is used by the client to record his/her interest in the job families represented by the work sample both before and after administration. In addition, the client records the level of difficulty of each performance and his/her own perception of how well the task was performed. The Individual Report Form is completed by the evaluator and includes work performance ratings, work behavior, work rate, and summary of the client's Self-Rating.
- b. Final Report Format - The Individual Report Form becomes part of the final report. Based on the data entered, a narrative summary of the results is written at the top of the form. Since the form has its own carbon copy, the client can have a copy of the assessment results. On the reverse side of the form is a preprinted description of the work sample and specific job related information. Upon completion of all work samples administered, a narrative composite of all results is usually prepared.

9. Utility

- a. Vocational Exploration - The client has a wealth of career information available in the work samples. Occupational information is presented at the beginning of the audiovisual cartridge. All tasks are depicted in the work environment.
- b. Vocational Recommendations - Based upon the results of the work sample evaluation and the preprinted data on the reverse of the report form, the counselor could make job, training, or further exploration recommendations using the DOT classifications provided.
- c. Counselor Utilization - The report forms generated by completion of each work sample can be used by counselors and clients alike. The front of the forms contains the evaluation data and the reverse preprinted side contains a description of the work sample and job related information.

10. Training in the System

- a. Training Required - Although not required, training is strongly recommended.
- b. Training Available - Training is available and can be presented either at Prep, Inc. or on site.
- c. Duration - One full day of work sample training is usually sufficient.
- d. Follow-up - Customers may contact Prep directly for technical assistance or to arrange follow-up training.

11. Technical Considerations

- a. Norm Base - Work sample norms reflect the criteria of acceptability used as industrial quality standards. Client's work is judged against stated preestablished levels. Time norms are not used.

- b. Reliability - No information available.
- c. Validity - Work sample validity is based solely on content validity, consisting of job analysis and the DOT. The methods are logical and result in a group of tasks that represent occupations within a particular job grouping. No other data on validation are available.

12. Reviewer's Summary and Comments

The Prep Work Samples are well-designed modules useful with a wide variety of disabled persons. The use of audiovisual instruction methods permits the presentation of occupational information as well as close monitoring of client progress. The manual clearly outlines the tasks comprising each work sample and how each task is assessed. One of the better features of the system is that each sample was designed around tasks common to several related occupations, instead of attempting to duplicate all the tasks present in one job. The construction and tools used in the Prep Work Samples give the impression of long use if routine maintenance is performed.

There are two potential problems in using these work samples with a rehabilitation population: (1) the use of audiovisual format can present problems for persons with hearing, visual and/or learning handicaps and (2) although designed in part for special needs students, the system does not seem appropriate for some lower functioning mentally retarded persons.

In spite of many genuinely good points, the system fails in the reliability and validity. There is simply no information available on the reliability of the system. Validity is based solely on a content analysis with the DOT and job analyses. Other types of validation are definitely needed.

13. Address

Prep, Inc.
1007 Whitehead Road Extension
Trenton, New Jersey 08638

14. Cost

Work sample prices range from \$480.00 (Fire Science and Police Science) to \$4,250.00 (Computer Technology); the average price is \$1,343.70. Each work sample comes with tools, cartridges, specific manual, storage cube, and all expendable materials for assessing ten clients. The cost of the Self-Rating Form and Individual Report Form is \$12.50 per set of ten.

15. References

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Pisauro, M. F. (1977). Comprehensive Occupational Assessment and Training System. Vocational Evaluation and Work Adjustment Bulletin, 2(3), 39-45.

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Pre-Vocational Readiness Battery

(Valpar 17)

1. Development

- a. Sponsor - Valpar #17 was developed by Valpar International.
- b. Target Group - The battery is aimed at assessing the functional skills of mentally retarded persons.
- c. Basis of the System - The manual contains no discussion on the basis of the system.

2. Organization

- a. Name and Number of Work Samples - The system contains five areas, each of which has several separate subtests:
 - (1) Development Assessment - Contains four parts which are "simple, functional, non-medical measures of physical and mental abilities": (a) Patterning/Color Discrimination Manipulation, (b) Manual Coordination, (c) Work Range/Dynamic Strength/Walking and (d) Matching/Vocational Knowledge/Measurement.
 - (2) Workshop Evaluation - A simulated assembly process during which three clients use a three step assembly process. A fourth person (either client or evaluator) acts as an inspector.
 - (3) Vocational Interest Screening - A sound/slide interest assessment in which the client compares two jobs. There are six area scores: social service, sales, machine operation, office work/clerical, physical sciences, and outdoor.
 - (4) Social/Interpersonal Skills - This consists of a two page form containing descriptions of commonly found barriers to employment. Four major areas are covered: (a) personal skills, (b) socialization, (c) aggravating behaviors, and (d) work related skills.
 - (5) Independent Living Skills - An assessment of: (a) transportation, (b) money handling, (c) grooming, and (d) living environments. The transportation and money handling areas contain three levels. Simulation and gaming techniques are used heavily in this area.
- b. Grouping of Work Samples - The subtests are grouped according to the five areas given above.
- c. There is an overall manual and a separate manual for each area, plus a sixth manual containing norms. Each manual is well organized and contains most setup, administration, and scoring instructions. The scoring instruction examples are unusually detailed.

3. Physical Aspects

- a. Packaging of the Work Samples - Equipment for each of the five areas is packaged separately.
- b. Durability - As with other Valpar work samples, all equipment is very durable. Construction is fiberboard laminated with formica.
- c. Expendable Supplies - Aside from the numerous forms and recording sheets, the system requires no expendable supplies.
- d. Replacement - Forms can be ordered from the developer or may be reproduced locally.
- e. Computer Requirements - Not applicable

4. Work Evaluation Process

- a. Preliminary Screening - Subtest One: Developmental Assessment is used as a preliminary screening to determine the evaluatee's general physical strength, mobility, and instruction following skills.
- b. Sequence of Work Sample Administration - Information presented by the developer states that the five sections can be given in any order. However, because the method of instruction giving for the rest of Valpar #17 is at least partially determined during the Development Assessment section, this part should be given first.
- c. Client Involvement - While the degree of client involvement with the evaluator varies with the section, in general there is a considerable degree of client-evaluator contact. Most of the tasks are administered individually. The manuals do not contain any discussion on procedures for feedback and for sharing the results with the client either during or after completion of the five areas.
- d. Evaluation Setting - The setting is not specified. However, the use of the various sections implies that a formal testing situation is created.
- e. Time to Complete the Entire System - While the time varies with the population tested, the general manual estimates 5 and a half hours for the entire battery.

5. Administration

- a. Procedures - Administration procedures layout, materials needed, and general instructions are clearly given in the manuals.
- b. Method of Instruction Giving - Instructions are given using a variety of methods. During the administration of the Development Assessment section, the evaluator is first to determine at which of three possible levels the client functions: (1) verbal, (2) verbal plus demonstration, and (3) verbal plus demonstration with a sample to follow. The appropriate level is used throughout the remainder of the Valpar #17. The Vocational Interest Screening uses a slide/cassette instruction method. Independent Living Skills uses a

combination of gaming and comparing pictures with accompanying verbal instructions.

- c. Separation of Learning/Performance - In the Workshop Evaluation part, some separation of learning from performance occurs; the client is corrected if he/she makes a mistake during the instruction period. However, there are no set criteria. This section of the outline is not appropriate for the other four parts. Each of these areas is an assessment of knowledge and of the ability to learn.
- d. Providing Assistance to the Client - The evaluator is to make certain that the client can perform the task or activity. In most parts, extra assistance would not interfere with the results. However, this area is one of the few areas not clearly covered in the manuals.
- e. Repeating Work Samples - Readministration is strongly recommended when it would facilitate either program evaluation or documentation of changes in client skills over a period of time for the purpose of adjustment areas of emphasis in training.

6. Scoring and Norms

- a. Time Scores - Except for one task in the Development Assessment Unit, no time scores are recorded; all parts are untimed except the Workshop Evaluation. In this part, the number of units assembled in 12 minutes is the score.
- b. Timing Interval - In the Workshop Evaluation, the 12 minute interval begins after the clients have understood the instructions and have practiced.
- c. Time Norms - No time norms are used, except for the one subtest noted above.
- d. Error Scoring - All parts are scored on the number of correct responses, except Interpersonal-Social Skills. In the Developmental Assessment Unit, most tasks are scored by giving either 4, 2, 1 or 0 points; many of the physical capacity evaluations record the number of pounds lifted or moved. The Vocational Interest Screening uses the number of choices in the six work areas. The Social-Interpersonal Skills uses a negative score in which the more skills and/or behaviors that are lacking, the greater the scores in each of the four areas. Finally, the numerous scored activities in the Independent Living Skills assign one or more points to each correct response.
- e. Scoring Aids - No scoring aids are used.
- f. Quality Norms - The only "quality norms," as this term is used in work sample scoring, are those for the Workshop Evaluation. The other four sections use norms based on the number of total points.
- g. Emphasis in Scoring - The scoring emphasis is on the number of "correct" or appropriate responses.

7. Observation of Clients

- a. **Work Performance** - None of the five sections identify any specific work performance factors.
- b. **Work Behaviors** - The Interpersonal-Social Skills area contains a section on work related skills. Some of the specific items are: (1) safety, (2) promptness, (3) following directions, and (4) work completion. Some of these skills are not defined in behavior terms. The Workshop Evaluation contains the following four items: (1) corrected work, (2) work backed up, (3) on task, and (4) work cohesively with others. Each is rated on a three-point scale. Other areas include space on forms for writing in general comments and observations.
- c. **Recording System** - For the Interpersonal-Social Skills, "behaviors" are rated using 0, 2, or 4 as a weight. The Workshop Evaluation uses a three-point scale of "never," "sometimes," and "consistently."
- d. **Frequency of Observation** - This point is really only applicable to the Workshop Evaluation section; the manual does not specify the frequency of observation.

8. Reporting

- a. **Forms** - Each of the five areas uses standardized, well-designed forms for recording responses and for scoring. Some of the forms include black and white reproductions of the stimulus slides and the transportation gaming exercise.
- b. **Final Report Format** - This is unspecified due to the wide variety of settings and applications for which the work sample was designed. However, the Individual Exit Profile provides a summary of all scores in a manner which transfers to individual education plans used in an educational setting. This same form provides a functional summary around which the narrative section of most reporting formats can be organized.

9. Utility

- a. **Vocational Exploration** - Two parts of the Valpar #17 offer some direct vocational exploration: Vocational Interest Screening and Workshop Evaluation. The Interest part allows for some exploration and provides some occupational information. The Workshop Evaluation, as a simulated assembly task, could give the client some concept of production line work.
- b. **Vocational Recommendations** - Each of the sections provides data that can be used to provide vocational recommendations. The specific recommendations would be based upon the final reporting format used.
- c. **Counselor Utilization** - The battery is designed specifically to facilitate counseling and/or training after assessment. The scoring format specifies goals and potentials by providing counselor insight into relative strengths and weaknesses. It also provides score sheets with pictorial representations of the work performed in that task to remind both the counselor and the evaluatee of the activity and performance in each area. Each subtest also provides

both a possible means of remediation or training and a format for reassessment to gauge improvements over time.

10. Training in the System

- a. Training Required - No training is required.
- b. Training Available - Formal training is available.
- c. Duration - At least one day or more, this depends upon evaluator needs.
- d. Follow-up - As requested by the user.

11. Technical Considerations

- a. Norm Base - A separate norms manual contains what the developers call "research norms" on 10 different groups (e.g., competitive employment, sheltered workshop, activity center, and homebound employment). The raw scores for each subtest are converted to a single percentile score. (The manual contains no information on how this percentile score was developed.) Over the percentile score on each table are three normal distribution curves, which represent three combinations of the norming groups. The user can apparently roughly determine where on these curves a person falls. Because there are no means, standard deviations, sample sizes, or descriptions of the samples available, it is impossible for this reviewer to make any comment regarding the norms.
- b. Reliability - No data presently available.
- c. Validity - No data presently available.

12. Reviewer's Summary and Comments

Valpar #17 is intended to be an assessment of the variables that must be considered when assessing a mentally retarded person's interests, vocational skills, and social maturity. The system is designed to be used by a person who is not trained in psychology, medicine, or occupational therapy. The system is well designed, attractive, and novel in many ways. The use of audiovisual and gaming materials will make it attractive to clients as well as evaluators. Data collection forms are unusually well designed. The major problems are in the technical areas. The manuals contain no background as to why certain components were selected, no relationship to previous work done in this field. No data are given on reliability and validity; there is not even a statement on these two factors. The norm data are impossible to interpret without additional information. In summary, this is a very attractive assessment device, but much more needs to be known about it.

13. Address

Valpar International
P.O. Box 5767
Tucson, Arizona 85703-5767

14. Cost

Pre-Vocational Readiness Battery.	\$4,595.00
Subtest - 1	\$895.00
Subtest - 2	\$995.00
Subtest - 3	\$350.00
Subtest - 4	\$250.00
Subtest - 5	\$2,365.00

15. References

Botterbusch, K. F. (1980). Pre-vocational readiness battery. In A. Sax (Ed.), Innovations in vocational evaluation and work adjustment. Vocational Evaluation and Work Adjustment Bulletin, 13(1), 26-28.

Nicholson, J. R., Nailen, P. M., & Tobaben-Wyssmann, S. (1984). Valpar #17 Pre-Vocational Readiness Battery: A question of norms. Vocational Evaluation and Work Sample Bulletin, 17(3), 67-70.

Skills Assessment Module

(SAM)

1. Development

- a. Sponsor - SAM was developed by Piney Mountain Press, Cleveland, Georgia. The manual was written by Michele Rosinek.
- b. Target Group - SAM "is designed to assess students (13-18 yrs.) identified by the school system as mildly handicapped (learning disabled, emotionally disturbed, mildly retarded and/or disadvantaged (economically and/or educationally). No screening is required beyond this point."
- c. Basis of the System - SAM is designed to access 24 behaviors (e.g., appearance and endurance) and certain general "aptitudes." The following sources were the basis of the system: U.S. Department of Labor Aptitudes, D-Map (i.e., Dunn Model for Assessment and Placement), Guide for Occupational Exploration, the Occupational Aptitudes Patterns of the USES General Aptitude Test Battery, and competency requirements in vocational training programs.

2. Organization

- a. Name and Number of Work Samples - The testing part of the system contains three paper-and-pencil tests and 12 work samples:

Paper-and-Pencil tests:

- (1) Revised Beta Examination (Second Edition)
- (2) Learning Styles Inventory developed by Piney Mountain Press
- (3) Oral Directions Test from the Personnel Tests for Industry

The 12 short work samples are as follows:

- (1) Mail Sort - Sorts 100 postcards by zip code.
 - (2) Alphabetizing - Files 50 postcards.
 - (3) Etch-A-Sketch Maze - Follows a maze overlaid on an Etch-A-Sketch.
 - (4) Payroll Computation - Computes a payroll for 9 persons.
 - (5) Patient Information Memo - Recopies information onto a form.
 - (6) Small Parts A - Inserts washers in slots with tweezers.
Small Parts B - Screws small screws into a metal block.
 - (7) Ruler Reading - Measures predetermined lines and draws lines to specific lengths.
 - (8) Pipe Assembly - Assembles cast iron pipes and fittings.
 - (9) O Rings - Sorts 12 different sizes of O rings.
 - (10) Block Design - Constructs a design according to a pattern.
 - (11) Color Sort - Sorts 50 cards by seven different colors.
 - (12) Circuit Board - Constructs a circuit following a diagram.
- b. Grouping of Work Samples - SAM is designed to be flexible. Each work sample is independent and can be administered in any order or in as many settings as desirable.

- c. **Manual** - The major sections of the manual are in logical sequence and flow from one section to the next. The manual defines all of the aptitudes and behaviors that the system claims it measures, general administration guidelines, instructions for each work sample and sections on scoring. Instructions for each work sample include the materials needed, purpose, interpretation and directions for administering and scoring. The major problem with the manual is the administration instructions for each work sample. These are often vague and imprecise. Valuable information is sometimes missing; for example, there are considerable gaps in the standardized instructions and demonstrations to the client.

3. Physical Aspects

- a. **Packaging of the Work Samples** - The entire system is contained in a wooden box about 2 x 3 x 1 1/2 feet. Within this box there is a compartment for each work sample. Each sample is packaged separate with all its components.
- b. **Durability** - Most of the samples are made of wood and plexiglass. With the exception of the file cards and other paper parts, the system appears to be fairly durable.
- c. **Expendable Supplies** - In addition to the paper-and-pencil tests, forms for the Ruler Reading, Patient Information and Payroll Computation are required for each student. A separate data entry form and paper for the printer are also needed.
- d. **Replacement** - The manual contains a complete parts list; all parts can be ordered from Piney Mountain Press.
- e. **Computer Requirements** - SAM contains one floppy disk to score and print student results. A second disk is available to develop a local scoring and task matrix program (see section on validity). This software is available for IBM-PC's and Apple II, IIe and IIc. Each requires a computer, monitor, one disk drive and printer.

4. Vocational Evaluation Process

- a. **Preliminary Screening** - No screening is required.
- b. **Sequence of Work Sample Administration** - The three paper-and-pencil tests are always administered first. The work samples can be given in any order and in as many settings as desired.
- c. **Client Involvement** - The manual does not contain any specific procedures for sharing results with the client. Apparently the client is not involved in planning the SAM evaluation. For each module the student is given an orientation regarding the purpose and expectations of the tasks; there is little client involvement beyond this.
- d. **Evaluation Setting** - Because SAM is intended for a school population, it is assumed that evaluation is done in a classroom atmosphere.
- e. **Time to Complete Entire System** - The manual states that administration takes from 1 1/2 to 2 1/2 hours.

5. Administration

- a. **Procedures** - The manual section on each module includes the purpose, materials needed, a description of the work sample "activity," verbal cue, interpretation and scoring. In spite of these headings, there are administrative problems. The "activity" and "verbal cue" sections are often vague and require several readings before they can be fully understood. Verbal and demonstration instructions should be clearly given.
- b. **Method of Instruction Giving** - All directions are given orally and by demonstration. The teacher is to give the student ample time to acquire the necessary skills for each module prior to timing.
- c. **Separation of Learning/Performance** - Before each work sample the client is to be given an orientation regarding the purpose and expectations of the tests given. The manual states: "Always allow for practice when indicated and make sure the participant acquires the required skills and concepts needed to perform the task before testing." Thus, there appears to be clear separation between learning and performance.
- d. **Providing Assistance to the Client** - The manual clearly states that "no assistance may be given during the performance phase."
- e. **Repeating Work Samples** - "After the initial administration of all the samples, the participant may be allowed to practice on specific samples to determine if he or she can score close to the MTM time...Simply readminister sample in the same manner as indicated on individual instruction sheets and keep a record of how many practice trials it takes to reach a competitive time."

6. Scoring and Norms

- a. **Timing** - Timing is started after the practice session and continues either until the task is completed or until the maximum time for each work sample is reached. The evaluator times the client.
- b. **Timing Interval** - Once the client has demonstrated adequate skill through the training (i.e., practice) session, the evaluator instructs the client to begin. Timing begins at this point. Each work sample has time limits and the client is instructed to stop if he/she has not completed the task by that time.
- c. **Time Norms** - Time and error data can either be scored by hand or fed into a computer program which determines time and error norms. Time scores are presented in percentiles based on student norms and MTM-1 industrial norm scores.
- d. **Error Scoring** - The number of individual errors are counted and entered into the scoring program. Errors for some of the samples (i.e., Patient Information Memo, Pipe Assembly, Block Design and Circuit Board) are not clearly defined.
- e. **Scoring Aids** - Some of the work samples, such as the Mail Sort and Alphabetizing, use scoring aids. Other work samples have illustrations showing the correctly completed task. Pages with correct responses are supplied with one work sample requiring written responses.

- f. **Quality Norms** - Student error norms are available and are reported in percentiles.
 - g. **Emphasis in Scoring** - The SAM manual clearly states that time and errors are of equal importance.
7. **Observation of Clients**
- a. **Work Performance** - No work performance factors are used in the SAM.
 - b. **Work Behaviors** - The following eight work behaviors are rated on a five point scale: appearance, communication skills, conforms to rules, endurance, initiative, interpersonal traits, reactions to assigned tasks and safety consciousness. All are generally defined in the glossary section of the manual; behavioral definitions are not used and no specific behaviors are defined for each point on the five point scale. Specific behaviors are not related to specific work samples.
 - c. **Recording System** - The Data Form contains a scale for rating behaviors, ranging from 1 ("superior") to 5 ("needs improvement"). The reader should note that no schedule or system of observations is required, nor is the evaluator required to reference or justify these very global ratings. Thus, only a global rating is recorded.
 - d. **Frequency of Observation** - Observations are to be made throughout the entire assessment period.
8. **Reporting**
- a. **Forms** - The Data Form is the one major form used. It is divided into three sections: (1) student identification, test scores and ratings for the verbal, numerical and GED levels; (2) work sample time start and stop, number of errors and norm scores; and (3) a five-point "Performance Graph" and the rating scale for the behaviors.
 - b. **Final Report Format** - The written final report uses the Data Form, mentioned above. The computerized scoring system also generates a form containing percentile, MTM results and graphic presentations of the scores. A second computerized report compares student performance with traits needed for success in various vocational training courses within the client's school. There are no provisions for a narrative report.
9. **Utility**
- a. **Vocational Exploration** - Due to the formal testing situation, the simplicity of the work samples, and the lack of client orientation relating work sample tasks to jobs, the system provides very little vocational exploration.
 - b. **Vocational Recommendations** - Recommendations can be made for specific training programs within a school system for the student. These training recommendations are the most important system output.

- c. Counselor Utilization - The system is designed to inform the counselor and student on "the student's level of performance as it relates to motor, cognitive, and affective demands inherent in an instructors' various training programs." If accurate, this information would be a very realistic tool for student choice.

10. Training

- a. Training Required - Training is not required prior to sale.
- b. Training Available - Training is available
- c. Duration - Duration is dependent on the needs of the evaluator and the number of persons to be trained. Time ranges from two hours to one day.
- d. Follow-up - Technical assistance is available after purchase through the publisher.

11. Technical Considerations

- a. Norm Base - SAM has both predetermined time study and psychometric norms. The predetermined norms were developed with MTM-1; the technical manual contains the 100% or industrial normal times. There are no conversion tables. Psychometric norms were developed on three samples consisting of "average students," "handicapped students" and "disadvantaged students" at "eight data collection sites in urban, suburban, and rural secondary and post secondary schools." Age, sex, education level and area of residence (i.e., urban, suburban and rural) are given for each sample. All norms are from Georgia. Specific sample sites, procedures and methods were not given. Thus, the user has limited information to interpret what a particular score means. There are two other problems with the norms: the largest sample consists of only 121 students, and the error score distributions were skewed.
- b. Reliability - The technical manual presents a single test-retest study over a three to five day period using Pearson's r . All of the correlations are over .80. These findings are very encouraging.
- c. Validity - A job-task matrix based on U.S. Department of Labor data was developed. This contains ratings of the importance of the factors as related to various school training programs. The user can modify this matrix for local use. The manual makes a serious error by assuming that the tasks are valid because they have MTM norms on the work samples (Botterbusch, 1981).

Validity for the SAM must be locally developed. The teacher has vocational teachers rate the degree to which each of the traits (e.g., verbal aptitude, appearance, manual dexterity) measured by SAM are required for success within that teacher's vocational program. This process is computerized and the evaluator can enter new data as needed. This emphasis on locally developed validity is seen by this reviewer as a positive step.

12. Reviewer's Summary and Comments

SAM is designed to give the teacher/evaluator a comprehensive, flexible and affordable assessment tool. It is intended to evaluate aptitudes, work behaviors,

learning styles and cognitive performances of students who are interested in entering the various training programs within a school system. The system can be administered in a relatively short time. It also has the advantage of permitting the evaluator to readminister work samples as a student training experience. Finally, the concept of relating assessment results to vocational training programs within the student's school is very practical and very useful.

SAM's problems are many and most of these center on the technical aspects of the system. The 24 traits measured are not carefully defined and there is no empirical evidence relating these traits to specific work samples. To compound this problem, there are no factor analysis studies to justify these traits.

The error scores and norms are badly skewed; this suggests that the samples are too easy for most of the students. The reliability study is not described well enough to permit the evaluator to judge these critical aspects of the system.

The major problem is with validity. Although the idea of developing local criterion for vocational training programs is very sound, the procedures given in the manual for developing such a system are totally inadequate. For example, there are no data collection forms, no procedures for relating the trait definitions to training requirements, no way to determine teacher reliability in ratings and, most important, no method for determining if the teacher ratings are valid. Thus, the system takes teacher ratings at face value. When this problem is combined with the lack of rigorous trait definition, the results are an instrument with unknown validity.

13. Address

Piney Mountain Press, Inc.
P.O. Box 333
Cleveland, Georgia 30528

14. Cost

Skills Assessment Module (includes: Manual, Revised Beta, Learning Styles Inventory, 12 work samples, scoring and disk for Apple or IBM computers and on-site training) \$1,695.00

Local Norm Development System (includes 1 disk and documentation) . . . \$195.00

15. References

None presently available.

System for Assessment and Group Evaluation

(SAGE)

1. Development

- a. Sponsor - SAGE was originally developed by Schabacher and Associates and Creative Development Associates, Inc.; rights are presently owned by the Train-Ease Corporation.
- b. Target Group - The system is currently being used by junior and senior high school students and in post-secondary education. According to the developer, it is especially useful with disadvantaged and some handicapped persons. Successful use has been reported with worker compensation and head trauma cases. It can also be used in private industry for hiring and re-training.
- c. Basis of the System - The fourth edition of the DOT, the Guide for Occupational Exploration, the Worker Trait Group Guide (Appalachia Educational Laboratory, 1978a) and Career Information System Guide (Appalachia Educational Laboratory, 1978b) formed the basis of the system. In general, SAGE was designed to assess for the traits in the Worker Trait Profile.

2. Organization

- a. Name and Number of Work Samples - The system consists of five different components (i.e., GOE Interests, Aptitudes, GED and Temperaments) that when used together are intended to give the evaluator a complete picture of the client on most of the variables contained in the Worker Trait Profile⁹. The five components are defined below:
 - (1) Vocational Interest Inventory (VII) - This untimed paper-and-pencil inventory measures the client's interests in the 12 interest areas taken from the Guide for Occupational Exploration.¹⁰ For each of the 152 items, the client makes two possible responses: (1) circles one response if he/she likes the activity and (2) circles another response if he/she has done the activity. Each item uses the following format:

Put parts on a car
Get people to like your ideas
Make beds in a hospital
 - (2) Vocational Aptitude Battery (VAB) - The VAB uses a combination of paper-and-pencil tests and isolated trait work samples to measure 11 aptitudes defined by the U.S. Department of Labor:

General - A multiple choice paper-and-pencil test with verbal, arithmetic reasoning and spatial items.

⁹ The only two parts of the Worker Trait Profile not measured by SAGE are Physical Demands and Environmental Conditions.

¹⁰ For a list of the 12 areas, see "interests" in the Glossary.

Verbal - A paper-and-pencil test using a stimulus word with four sets of response words. The person chooses the response word that is the same or opposite in meaning.

Numerical - A paper-and-pencil test containing subtests in computational items and "reading problems."

Spatial - A performance requiring the client to reproduce patterns of varied sized gears on a console using a photograph as a stimulus.

Form Perception - A multiple choice test with several colored pages of tools and materials; the client finds the tool that matches the stimulus photograph.

Clerical Perception - Consists of four subtests, two multiple choice and two performance; a booklet is checked to determine if names and numbers are the same; cards are sorted by numerical and alphabetical order.

Motor Coordination - "A manipulative test that requires clients to perceive a light flashing on a large electronic control board and within a half second period of time push or hit a button under the light with either hand." One hundred lights flash per minute; this is self-timing and self-scoring.

Finger Dexterity - Small specifically modified compression unions are assembled on 3/16 inch pins; no tool are used.

Manual Dexterity - Large conduit fittings are assembled on a special console. No tools are used; the client must use his/her entire hands and wrists.

Eye-Hand-Foot Coordination - Using a test similar to that used for World War II and Korean War pilot selection, the client uses a stick and foot pedals to match three sets of lights showing on a console.

Color Discrimination - A multiple choice test consisting of several pages of standard color samples. The client must find the colored dot that matches the stimulus.

- (3) **Cognitive and Conceptual Abilities Test (C-CAT)** - This multiple choice paper-and-pencil test measures six levels of General Educational Development (GED). There are separate subtests for Reasoning, Mathematics, and Language. Results are converted to scale scores from one to six.
- (4) **Assessment of Work Attitudes (AWA)** - An untimed 30 item scale covering 20 common work attitude categories, such as workmanship, deferred gratification, and persistence as they relate to a specific work related situation. A typical item is as follows:

How many people believe in always being on time for work?

- a. 1 out of 5
- b. 2 out of 5
- c. 3 out of 5
- d. 4 out of 5

(5) Temperament Factor Assessment Unit - This 90 item untimed true and false test measures the ten U.S. Department of Labor Temperaments¹¹.

- b. Grouping of Work Samples - The tests, attitude scales, etc. are grouped into the five areas outlined above.
- c. Manual - The loose-leaf binder contains all system details. There is a separate section for each test. Each contains general information, specific instructions for clients and administrators, and manual and machine scoring. Other sections of the manual give copies of forms, provide scoring examples, and offer some information on interpretation. In general, the manual is well written and easy to follow.

3. Physical Aspects

- a. Packaging of the Work Samples - Each test apparatus is packaged independently.
- b. Durability - While no durability data are available, the plastic cases give the impression of being fairly durable.
- c. Expendable Supplies - There are no consumable supplies except for forms and answer sheets; these may be produced locally.
- d. Replacement - An 800 telephone number is supplied for securing replacements or service for the test apparatus. To maintain standardization, users should check with SAGE before using local parts.
- e. Computer Requirements - The SAGE system has an optional machine scoring system called "Auto-Score" that includes a card reader, software, data entry and scoring cards. SAGE results can be used directly as input into the JOBS job matching system through the use of "Scor-O-Matic." The entire system requires: IBM or IBM compatible computers with the 2 disk drives, 640 K RAM, communication port, monitor, and 120 CPS dot matrix printer.

4. Work Evaluation Process

- a. Preliminary Screening - No preliminary screening is used. SAGE can be considered as the first step in vocational evaluation; this system can also be used alone for vocational assessment.
- b. Sequence of Work Sample Administration - The five components can be given in any order. Within the VAB, the aptitude tests can be given in any order or on different days.

¹¹ See "temperaments" in glossary for a list of the ten temperaments.

- c. Client Involvement - There is little client involvement during testing. Client involvement before and after testing centers around a good orientation on why they are being tested, what it will do for them and how it relates to training or placement.
- d. Evaluation Setting - The paper-and-pencil and apparatus tests will remind the client that he/she is in a formalized testing situation.
- e. Time to Complete Entire System - Several persons can complete the entire system in about four hours. The system provides for multiple administration; in the VAB there is enough equipment/material to assess 23 people simultaneously.

5. Administration

- a. Procedures - One comprehensive manual provides detailed instructions on the purpose, general characteristics, directions and scoring for each unit of the SAGE.
- b. Method of Instruction Giving - Each instrument can either be self-administered (if the client reads at the fourth grade level) or by having the instructions read aloud. The VII uses a titled filmstrip and cassette tape that contains instructions as well as the test items.
- c. Separation of Learning/Performance - The C-CAT and the VAB tests have the following procedures: initial instructions, timed practice exercises and the actual test. Thus, there is a clear separation of learning from performance. SAGE contains a higher proportion of practice items to the test items than do most other tests.
- d. Providing Assistance to the Client - The evaluator may read instructions and some test items. Evaluators and teachers are instructed to answer all questions before and after the practice session. No assistance is given during the timed portions of the tests.
- e. Repeating Work Samples - Readministration is permitted if the evaluator believes results are not valid. According to the developer, SAGE may be used for pre and post testing.

6. Scoring and Norms

- a. Timing - The C-CAT and VAB use an electric timer, controlled either by the client or evaluator. A buzzer and light mark the completion of each timed period. A multi-choice electronic score recorder and timer are also available. The Eye-Hand-Foot and Motor Coordination tests have built in timers.
- b. Timing Interval - For each test there is a specific set time for both the practice items and the actual test items.
- c. Time Norms - For the VAB and C-CAT the number of correct responses is converted to a scale score of one to five or six. These scores correspond to the Aptitude and GED levels used in the Labor Department system. The AWA is scored using a Likert-type scale from one to four. Item values are totaled and the resulting score compared to three scoring ranges: job ready, "?" and

doubtful. In the VII the number of items chosen in each of the 12 interest areas are totaled and compared to preselected arbitrary cut-off points.

In the Temperament test the number of true responses chosen for each ten factors are rank ordered. A total of five or more true answers per factor indicates a clear distinction, three to four true responses is a mild indicator and one to two indicate a strong reaction against the factor.

- d. Error Scoring - This is not relevant; no errors are recorded.
- e. Scoring Aids - Scoring keys are used with all paper-and-pencil tests. Several units have built in self-timing and scoring devices. The Scor-O-Matics provide for self-scoring and timing for all multiple choice tests except the C-CAT.
- f. Quality Norms - Not relevant; no errors are recorded.
- g. Emphasis in Scoring - Not relevant because only one type of score, a correct response, is recorded.

7. Observation of Clients

- a. Work Performance - No work performance factors are used in the SAGE system.
- b. Work Behavior - The system uses one form, the "Observation Record," to record 19 separate behaviors; these are grouped into six "factors": social/cooperation, communication, personal, working/learning, physical and handicaps.
- c. Recording System - The Observation Record uses a four point rating scale (unsatisfactory, marginal, average, and superior). The points for each scale are totaled.
- d. Frequency of Observation - No procedures are given in the manual.

8. Reporting

- a. Forms - SAGE uses a variety of forms: answer sheets, scoring keys, conversion tables and a SAGE Profile Form. All forms are well-designed and internally consistent with each other.
- b. Final Report Format - The SAGE Profile Form consists of an Observation Record, Raw Score Conversion Profile Occupational Match Form and a first page containing general information about the client and recommendations for additional evaluation, training program placement and/or job placement. The final report is a product of the individual worker traits (i.e., Aptitudes, GED, Temperaments and Interests, plus Attitudes) measured by SAGE and a match of the job demands for individual occupations.

9. Utility

- a. Vocational Exploration - SAGE provides minimal vocational experiences; there are few hands-on materials and little vocational explanation given prior to testing, other than the general orientation.

- b. Vocational Recommendations - The SAGE Profile Form contains specific job recommendations by DOT title and code. SAGE's data base contains aptitudes and GED results for 487 commonly held occupations. An additional manual provides information on matching over 12,099 job titles. The system can also be used with other commercial assessment systems (there are cross-references relating the Aptitudes as measured by SAGE to JEVs, Micro-TOWER, Project Discovery, SAVE, Valpar, Singer, VIEWS, and VITAS), with job site training, further testing, etc.
- c. Counselor Utilization - Counselor utilization would depend upon two variables: (1) How SAGE is integrated with other vocational evaluation tools and (2) how well the counselor knows and uses the DOT and related data. A software package JOBS is available for on-site job matching (See Botterbusch, 1986 for a description of JOBS.)

10. Training in the System

- a. Training Required - Although not required, training is recommended.
- b. Training Available - Training is available either on-site or in New York.
- c. Duration - Training is for one day.
- d. Follow-up - The developer provides a toll free number to answer any questions.

11. Technical Considerations

- a. Norm Base - There are four norm groups for the SAGE: (1) low functioning with a sample size of 240, (2) successfully employed with a sample size of 400, (3) vocational-technical students with a sample size of 650 and (4) general working population with a sample size of 1800. Results are presented as standard scores, z scores, percentiles and Aptitude, and GED level scales. The manual contains no information as to the source and characteristics of this sample.
- b. Reliability - Test-retest coefficients and standard errors of measurement were used to determine reliability for most of the tests. Most of the KR-20 reliability coefficients are reasonably high.
- c. Validity - A variety of item analysis data and validity data are presented for each section. Validity data includes correlations with ratings and other tests; the majority of these are at acceptable levels.

12. Reviewer's Summary and Comments

SAGE is not a traditional work sample system, but rather is a combination of paper-and-pencil tests and isolated trait work samples that can be administered in about four hours. It can be used either by itself or as a screening device given prior to a longer period of vocational evaluation. The developer has gone as far as providing charts of the relationship between SAGE and the more popular commercial work sample systems. Because it is basically an ability assessment device, SAGE should be supplemented with appropriate occupational exploration. Although some behaviors are observed and recorded, most evaluators will want to

collect additional behavioral data. Overall, SAGE gives the initial appearance of a well-planned assessment tool that is aimed mostly at secondary school students, especially the disadvantaged.

The major advantages of the system are its relationship to DOT related variables, its relatively short administration time, and its apparent flexibility when used in combination with other systems. Finally, while SAGE is not specifically designed for a handicapped population, it can be used with most types of disabilities by making a few commonsense modifications.

13. Address

Progressive Evaluation Systems Corp.
21 Paulding Street
Pleasantville, New York 10570

14. Cost

The cost per component is:

Vocational Aptitude Battery	\$5,495.00
Vocational Interest Inventory	\$500.00
Cognitive and Conceptual Abilities Test	\$500.00
Assessment of Work Attitudes	\$500.00
Temperament Factor Assessment Unit	\$ 375.00
Total.	\$7,370.00

Other costs are:

On-site training (travel expenses not included):

First day	\$500.00
Second consecutive day	\$250.00
Additional SCOR-O-MATICS.	\$275.00
Additional Electronic Timers	\$49.50
SAGE carrying cases	\$650.00
Job Opportunity Based Search (JOBS).	\$485.00 to \$2,000.00

15. References

Botterbusch, K. F. (1982). SAGE - System of assessment and group evaluation. Vocational Evaluation and Work Adjustment Bulletin, 15(1), 32-34.

Talent Assessment Program

(TAP)

1. Development

- a. Sponsor - TAP was initially developed by Mr. Wilton E. Nighswonger. It is marketed by Mr. Ben Borden of Talent Assessment Inc. of Jacksonville, Florida.
- b. Target Group - TAP is intended for use with a wide range of populations and mental ability levels above trainable mentally retarded. It has been used with disadvantaged, handicapped, and "regular" high school students, vocational-technical school students and adults.
- c. Basis of the System - TAP was designed to measure "functional aptitudes applicable to things and materials in the world of work." The system measures a number of coordination, dexterity and perceptual aptitudes, as defined in the manual. Because the manual contains no development history of the system, it is difficult to assess the nature of these aptitudes.

2. Organization

- a. Name and Number of Work Samples - Ten tests are included in the system:
 - (1) Structural and Mechanical Visualization - Assembles small metal frame following a model.
 - (2) Discrimination by Size and Shape - Sorts 12 different sizes and shapes of screws.
 - (3) Discrimination by Color - Sorts six different colored marbles.
 - (4) Discrimination by Touch - Sorts 12 sandpaper disks by degree of roughness.
 - (5) Dexterity without Tools-Small - Finger assembly of electrical slip bolts, clips and nuts.
 - (6) Dexterity without Tools-Large - Hand assembly of 12 large electrical conduit couplers.
 - (7) Dexterity with Small Tools - Inserts large staples with tweezers and screws a metal bar over them.
 - (8) Dexterity with Large Tools - Uses a crescent and other wrenches to assemble bolts to a frame.
 - (9) Visualization of Flow Patterns - Determines the flow of electricity in ten simple diagrams.
 - (10) Retention of Mechanical and Structural Detail - Assembles the frame in the first work sample without a model.
- b. Grouping of Work Samples - Each test is administered and scored independently. With the exception of Tests 1 and 10, the tests can be given in any order.
- c. Manual - The system manual contains general directions, scoring information, norms tables as well as several examples of profiles. Specific instructions are given for materials, set-up and administration procedures for both client and

evaluator. Photographs are used to insure proper layout. The manual is very well organized.

The TAP computer manual contains instructions for machine scoring and searching for specific jobs based on the client profile. This manual is well-written and easy to follow. In addition to the computer instructions, the manual defines the DOL job analysis terms used in the software.

3. Physical Aspects

- a. Packaging of the Work Sample - Each work sample is packaged independently; most of the work samples are contained in heavy plastic cases. Optional carrying cases are available; this increases the portability of the system.
- b. Durability - TAP uses sturdy plastic cases and many of the metal components are made of case hardened steel. TAP tools and equipment are extremely durable.
- c. Expendable Supplies - Aside from recording forms and paper for the printer, TAP uses no expendable supplies.
- d. Replacement - If any replacement parts are needed, they could be ordered from the developer or purchased locally. The profile form and time sheets can be locally reproduced.
- e. Computer Requirements - The scoring and job matching components are available for Apple II, IIc and IIc, TRS-80, and IBM-PC. Each system requires the following: computer with a minimum of 64K RAM, monitor, one disk drive, and printer. The evaluator must supply his/her DOS. The scoring and job matching programs are contained on four floppy disks.

4. Vocational Evaluation Process

- a. Preliminary Screening - There is no mention of preliminary screening in the manual.
- b. Sequence of Work Sample Administration - The Structural and Mechanical Visualization Work Sample (number 1) must be given first and work sample number 10 (Retention of Structural and Mechanical Detail) last. The rest may be given in any order. This is because the last work sample requires the client to construct the same structure as does the first work sample, except it is done without a model. Thus, this separation is needed as a measure of retention.
- c. Client Involvement - The type and degree of client involvement and feedback during administration is left to the discretion of the evaluator. The manual contains no specific procedures to be followed to ensure client participation. However, "Assessment results should be shared with [the] client as soon as possible. The original copy of the profile is usually given to those assessed."
- d. Evaluation Setting - Although the evaluation setting is not specified, TAP lends itself to a formal testing atmosphere.

- c. Time to Complete the Entire Battery - The tests can be administered in from two to two and a half hours. Computerized scoring should take about ten minutes.

5. Administration

- a. Procedures - The materials, tools, layout, client instructions, and demonstrations are specified in detail; photographs are used to obtain precise equipment set-up. The manual cautions against testing persons who are under medication, ill, depressed, etc.
- b. Method of Instruction Giving - While the basic method of instruction giving is oral with demonstration, the teacher or evaluator is to "make certain that clients have complete understanding of directions by giving them orally and, if necessary, by: demonstration, having clients demonstrate, having clients repeat directions, permitting clients to practice." No reading is required for any test. Any spoken language may be used; sign language can also be used. In short, with the TAP system any form of instruction and communication is acceptable as long as the client understands the instructions.
- c. Separation of Learning/Performance - There is a client practice period prior to beginning timing. After this practice period timing begins. Because the TAP manual emphasizes having the client fully understand the instructions, there is considerable separation of learning and performance.
- d. Providing Assistance to the Client - TAP is one of the few work sample systems where assistance can be given after the practice section is completed: "If a client is observed doing an assessment in the wrong manner, stop the work and start again, after complete understanding is achieved."
- e. Repeating Work Samples - To quote the manual: "Assessment should be redone if individuals express the feeling that they can do better. This will happen with a few who ultimately realize that they did not really try."

6. Scoring and Norms

- a. Timing - The evaluator times the client using an electronic timer that records minutes and tenths of minutes.
- b. Timing Interval - Timing begins when the client fully understands the instructions and stops when the task is completed.
- c. Time Norms - The actual completion time to the nearest tenth of a minute is recorded. After any "penalty" (see directly below) scores are added to the completion time, the total raw time score is compared to percentile norms. With the computer scored option, the completion time minus any penalty is entered into the computer for each work sample. In both the manual and computer systems, the evaluator selects the appropriate norm group.
- d. Error Scoring - Tests 5, 6, 7 and 8 are completion tests. The evaluator checks the task and, if not complete, the client is told to complete the task. The additional time needed is recorded and added to the original time. Tests 1, 2, 3, 4, 9 and 10 incorporate errors into the time score; a penalty time is

assigned based on the number of errors. This time is added to the raw score and the new score is compared to percentile norms.

- e. Scoring Aids - The design of the tests prevents the use of scoring aids.
- f. Quality Norms - There are no separate quality norms. In those tests which are scored for errors, the number of errors are multiplied by a constant number and the resulting "penalty" is added to the raw time score.
- g. Emphasis in Scoring - The emphasis is clearly on time scores.

7. Observation of Clients

- a. Work Performance - A few work performance factors are mentioned, but none are defined; no information is given for their observation.
- b. Work Behaviors - A few work behaviors are mentioned, but none are defined; no information is given for their observation.
- c. Recording System - No method for rating behaviors is used.
- d. Frequency of Observation - This is not specified. Because TAP is intended to be used primarily as an objective assessment battery, the system's developer chose not to emphasize client observation.

8. Reporting

- a. Forms - A raw score form is used to record starting and stopping times, errors, etc. for each work sample. Both manual and machine scoring are based on this form.
- b. Final Report Format - The manual report is a profile sheet containing percentile scores for each work sample; a placement and training number (PAT) is assigned to each individual profile sheet. This number is assigned to each individual sheet based on performance and specific occupations in the DOT, worker trait groups in the GOE.

The computer generated report begins with demographical data. Next the test times and percentile scores are presented in both tabular and graphic form. The individual aptitude strengths are then listed. A short narrative for each test explains the relation between the test and occupational areas. Finally, a list of high PAT profiles is printed. At this point the evaluator inserts one of the three job data base disks and selects DOT titles based on identical PAT numbers.

9. Utility

- a. Vocational Exploration - Because the system is really a group of standardized perceptual and dexterity tests, they are too abstract to provide vocational information to the client without interpretation by the teacher or evaluator.
- b. Vocational Recommendations - Using the PAT number(s) for each individual profile, the manual lists exact job titles with DOT codes. This job listing is fairly comprehensive.

- c. Counselor Utilization - The profile sheet or the computerized final report with its occupational recommendations is designed for the counselor, teacher, employer or client. The user has specific information on individual jobs that can be used in a variety of ways.

10. Training in the System

- a. Training Required - Training is required prior to use.
- b. Training Available - Training is held at the purchaser's site. All expenses for training are included in the purchase price.
- c. Duration - Training takes about a day and a half.
- d. Follow-up - Information and consultation can be provided as needed.

11. Technical Considerations

- a. Norm Base - The manual contains the following norm groups: (1) 12th grade male/female combined samples of over 5,000; (2) 12th grade females; (3) 12th grade males; (4) grade 7 and 8 male/female combined samples of about 5,000; (5) grade 7 and 8 males; (6) grade 7 and 8 males and (7) approximately 1,000 mentally retarded males and females in special education programs. The computer scoring software lists three norm groups: (1) high school seniors; (2) junior high school population, and (3) mentally retarded populations. Although these groups are of adequate size, the manual contains no details of sample selection nor of sample characteristics. The reviewer considers this to be a serious problem.

There are three separate PAT-DOT data bases. The first contains about 228 jobs; these are largely skilled, technical and professional jobs in "Things" areas. The second data base is designed for "handicapped." These are mostly semi-skilled and unskilled mechanical or industrial jobs. These two data bases are contained both in the manual and on the scoring software. The final data base is flexible software designed to allow the evaluator to develop his/her own local data base.

- b. Reliability - The developers report a coefficient of stability of over .85 in preliminary test-retest studies over a six month period. Unfortunately, not enough information on the methodology and subjects is included to judge these results.
- c. Validity - No data are available.

12. Reviewer's Summary and Comments.

As opposed to other work evaluation systems that attempt to present a complete picture of the client, TAP can be characterized as a battery of perceptual and dexterity tests designed to measure gross and fine finger and manual dexterity, visual and tactile discrimination, and retention of details. Thus, the system is limited to the assessment of these fairly specific factors. The developer does not claim that this system will assess all vocational significant capacities and behaviors. In fact, the manual states that other assessment devices should be used in addition to TAP to obtain a complete evaluation of the client.

TAP's major advantages include durable equipment, a well-written manual, flexibility in client instructions and a computerized scoring program.

The system's problems are largely technical. Norm groups should be defined in greater detail and additional reliability studies are needed. Although the printout lists numerous "aptitudes," these are not defined in the manual, nor are they related to specific TAP tests. There is no reported research to support either the definitions or their relationship to the ten TAP tests. The most important part of the system is the transformation of the test profile to the three digit PAT codes. Each of these codes is then related to specific jobs. Yet the manual contains no description of the research or other processes used to establish this relationship. In addition, no empirical validity information is available. This lack of both construct and empirical validity information casts doubts on the TAP system.

13. Address

Talent Assessment Inc.
P.O. Box 5087
Jacksonville, Florida 32247-5087

14. Cost

Complete Talent Assessment System (includes all TAP testing components, computer software for scoring, portable carrying cases, 1 and 1/2 days of on-site staff training, and shipping and handling) \$5,360.00

TAP components (includes staff training and shipping) \$4,670.00

Computer software (for Apple, TRS-80 and IBM) \$495.00

Portable Carrying Cases \$195.00

15. References

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Zikmund, D. and Reinder, L. (1974). Talent Assessment Program Test Battery [sic]. In A. Sax (Ed.), Innovations in vocational evaluation and work adjustment. Vocational Evaluation and Work Adjustment Bulletin, 7(4).

The TOWER System

(TOWER)

1. Development

- a. Sponsor - TOWER¹² was originally developed with funding from the U.S. Department of Health Education and Welfare, Vocational Rehabilitation Administration. Subsequent refinements have been made by the ICD, International Center for the Disabled.
- b. Target Group - Apparently the system was first developed for physically disabled persons; it is now used for all types of disabled persons, such as emotionally disabled.
- c. Basis of the System - TOWER is based on job analysis of positions that were considered open to handicapped persons in the New York City area.

2. Organization

- a. Name and Number of Work Samples - The system contains 93 work samples arranged into 14 job training areas:
 - (1) Clerical - Business Arithmetic; Filing, Typing, One-hand Typing; Payroll Computation; Use of Sales Book; Record Keeping; and Correct Use of English.
 - (2) Drafting - T-Square and Triangle; Compass; Working Drawing; Drawing to Scale; and Geometric Shapes.
 - (3) Drawing - Perspective; Forms, Shapes and Objects; Shading; Tone and Texture; Color; and Free Hand Sketching.
 - (4) Electronics Assembly - Color perception and Sorting; Running a 10 Wire Cable; Inspecting a 10 Wire Cable; Lacing a Cable; and Soldering Wires.
 - (5) Jewelry Manufacturing - Use of Saw; Use of Needle Files; Electric Drill Press; Piercing and Filing Metals; Use of Pliers; Use of Torch in Soldering; and Making Earring and Broach Pin.
 - (6) Leathergoods - Use of Ruler; Use of Knife; Use of Dividers; Use of Paste and Brush; Use of Scissors and Bond Folder in Pasting; Constructing Picture Frame; and Production Task.
 - (7) Machine Shop - Reading and Transcribing Measurements; Blueprint Reading; Measuring with a Rule; Drawing to Measurement Metal Layout and Use of Basic Tools; Drill Press Operation; Fractions and Decimals; Measuring with the Micrometer Caliper; and Mechanical Understanding.
 - (8) Lettering - Lettering Aptitude; Alphabet and Use of T-Square; Use of Pen and Ink; Use of Lettering Brush; and Brush Lettering.
 - (9) Mail Clerk - Opening Mail; Date-Stamping Mail; Sorting Mail; Delivering Mail; Collecting Mail; Folding and Inserting; Sealing Mail; Mail Classification, Use of Scale; and Postage Calculation.

¹² "TOWER" is an acronym for "Testing, Orientation and Work Evaluation in Rehabilitation."

- (10) Optical Mechanics - Use of Metric Ruler; Use of Calipers; Lens Recognition; Lens Centering and Marking; Use of Lens Protractor; and Hand Beveling and Edging.
 - (11) Pantograph Engraving - Introduction to the Engravograph; Setting-up, Centering Copy and Determining Specified Ratios; Use of Work-holder and Adjustment of Cutter; and Setting-up and Running Off a Simple Job.
 - (12) Sewing Machine Operating - Sewing Machine Control; Use of Knee Lift and Needle Pivoting; Tacking and Sewing Curved Lines; Upper Threading; Winding and Inserting Bobbin; Sewing and Cutting; and Top Stitching.
 - (13) Welding - Measuring; Making a Working Drawing; Identifying Welding Rods; Use of Acetylene Torch; Use of Rods and Electrodes; Use of Torch and Rod; Measuring and Cutting Metal; and Soldering.
 - (14) Workshop Assembly - Counting; Number and Color Collation; Folding and Banding; Weighing and Sorting; Counting and Packing; Washer Assembly; Inserting, Lacing and Typing; and Art Paper Banding.
- b. Grouping of Work Samples - The work samples are grouped into 14 major areas of training. While each of the 14 areas is independent, the work samples within each area are arranged in order of complexity. In most instances, simpler tasks must be completed before beginning complex ones.
 - c. Manual - The printed manual is bound in a loose-leaf folder. There is a separate section for each of the 14 areas. Each contains the following major headings: orientation, preparation, instructions for each work sample scoring criteria, and any scoring aids. Some details on the set-up are not included; also it is not always clear if instructions should be read to the client or read by the client.

3. Physical Aspects

- a. Packaging of the Work Samples
- b. Durability
- c. Expendable Supplies
- d. Replacement
- e. Computer Requirements

Because ICD does not sell hardware or equipment, each facility must construct their own. Therefore, this information would depend upon the individual facility.

4. Work Evaluation Process

- a. Preliminary Screening - This is emphasized for planning purposes, but the specific information needed prior to administration of the system is not specified.
- b. Sequence of Work Sample Administration - Administration is progressive within the major areas; the choice of areas depends upon client interest and/or the evaluation plan.
- c. Client Involvement - No client involvement procedures are specified in the manual.

- d. Evaluation Setting - A realistic work atmosphere and setting are stressed.
- e. Time to Complete the Entire System - The average client completes the entire system in three weeks; however, clients seldom take all work samples in the system.

5. Administration

- a. Procedures - The purpose and procedures are clearly described. All required tools and materials are listed. Almost no layout details are given.
- b. Method of Instruction Giving - The system uses mainly written instructions that are supplemented by evaluator explanation and demonstration when needed.
- c. Separation of Learning/Performance - Many of the work sample instructions contain no separation between a formal practice period and an established timing period. This manual is not at all clear on this point.
- d. Providing Assistance to the Client - The evaluator is encouraged to ensure that the client knows how to perform the task before he/she begins to work; procedures for assisting the client after he/she has started the task are not specified.
- e. Repeating Work Samples - The readministration of work samples is encouraged for the purpose of upgrading client performance.

6. Scoring and Norms

- a. Timing - The evaluator times the client, but no procedure for timing is established.
- b. Timing Interval - Timing begins following instructions and stops upon completion of the task. Often, however, this point is difficult to locate.
- c. Time Norms - Time results are rated on a five-point scale, based upon the number of minutes to completion.
- d. Error Scoring - All items are checked against carefully defined scoring criteria.
- e. Scoring Aids - Extensive use is made of transparent overlays and other scoring aids.
- f. Quality Norms - All work samples are rated on a five-point scale, based upon the number of errors.
- g. Emphasis in Scoring - Time and the quality of the finished product are given equal weight.

7. Observation of Clients

- a. Work Performance - The only work performance factor specifically listed is "dexterity."

- b. **Work Behaviors** - A comprehensive checklist of work behaviors (e.g., neatness, attendance) are contained in the vocational evaluation report.
- c. **Recording System** - A five-point system is used to rate "work and personal characteristics"; the points on the scale are not clearly defined.
- d. **Frequency of Observation** - Frequent observations are not emphasized, but are taken for granted. There is no established procedure for behavior observation.

8. Reporting

- a. **Forms** - Standardized forms are used for attendance and punctuality; for a summary of time and quality results for each work sample; and for a "vocational evaluation report."
- b. **Final Report Format** - The three page final report contains ratings of "Work and Personal Characteristics," ratings for each of the 14 job areas and a narrative report.

9. Utility

- a. **Vocational Exploration** - The client is exposed to many different training areas which are representative of a variety of jobs. The manual contains some specific occupational information that is given during the administration of the work samples.
- b. **Vocational Recommendations** - Vocational recommendations are limited to jobs that are directly related to the work samples. The recommendations are not highly related to the DOT and are primarily training oriented.
- c. **Counselor Utilization** - Counselor involvement in the evaluation process is recommended; the final report is aimed at the referring counselor and client.

10. Training in the System

- a. **Training Required** - Training is required, for inexperienced vocational evaluators.
- b. **Training Available** - Includes training in other work sample systems as well as work sample development.
- c. **Duration** - One and two week introductory courses.
- d. **Follow-up** - No

11. Technical Considerations

- a. **Norm Base** - The system was normed on clients at the ICD, International Center for the Disabled: sample sizes or characteristics are not given. Industrial norms are not available.
- b. **Reliability** - No data available.

- c. Validity - A seven city research study produced equivocal results. The empirical validity of the TOWER is still open to much question.

12. Reviewer's Summary and Comments

The TOWER System is the oldest complete work evaluation system and over the years has served as a model for the development of many work samples. The TOWER uses a realistic job setting to thoroughly evaluate clients for a rather narrow group of jobs. The facts that the TOWER was based on job analysis and that the system has been used for many years to place and train handicapped people are indications that the system is very useful in evaluating clients for a small group of jobs. The lack of precise definitions for work performance factors and client behaviors and the lack of adequate norms are the major weaknesses of the system. The high use of written instructions and the high level of the areas evaluated restricts its use with low literate and mentally retarded clients.

13. Address

International Center for the Disabled
340 East 24th Street
New York, New York 10010

14. Cost

Manual - (Includes work sample directions, response sheets and scoring criteria).

Without Training	\$250.00
Upon Completion of Training	\$100.00

Individual work samples, plus 3 extra sets of evaluations	\$25.00 to \$75.00
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Training Tuition

One Week Course	\$250.00
Two Week Course	\$450.00

Note: No hardware is sold by ICD; each facility constructs its own work samples. ICD estimates cost to set up a complete unit is \$5,000.00.

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Valpar Component Work Sample Series

(Valpar)

1. Development

- a. Sponsor - The work samples were developed or modified by Valpar International.
- b. Target Group - Originally intended for use with the general population, the Valpar work samples have been used extensively with industrially injured workers. The manuals do not contain a statement that the work samples are designed to serve any specific population; it is assumed that Valpar work samples are useful with a wide variety of client groups. Modifications are available for Valpar 1, 2, 3, 4, 7, 8, 9, and 10 for visually disabled persons. Videotapes and signed administration instructions are available for deaf persons on Valpar 1 to 16, except 14.¹³
- c. Basis of the System - According to the developers, the work samples are based on the trait-and-factor approach taken from job analysis. The manual for each work sample relates that work sample to several Worker Trait Groups Arrangements as well as specific occupations.

2. Organization

- a. Name and Number of Work Samples - At present 19 work samples are contained in the series:
 - (1) Small Tools (Mechanical) - Use of small tools, such as screwdrivers, pliers, and wrenches.
 - (2) Size Discrimination - Attaches nuts of different sizes to randomly arranged bolts.
 - (3) Numerical Sorting - Sorts by numbers and number series.
 - (4) Upper Extremity Range of Motion - Range of motion of upper torso through placing nuts on bolts from many different angles.
 - (5) Clerical Comprehension and Aptitude - Evaluates general clerical, book-keeping and typing.
 - (6) Independent Problem Solving - Measures ability to perform tasks requiring the visual, comparison and selection of abstract designs.
 - (7) Multi-Level Sorting - Sorts by a combination of numbers, letters and colors.
 - (8) Simulated Assembly - Ability to perform a repetitive task requiring finger and manual dexterity.
 - (9) Whole Body Range of Motion - Agility of gross body movements for trunk, arms, hands, fingers and legs.
 - (10) Tri-Level Measurement - Ability to perform from very simple to very precise inspection and measurement.
 - (11) Eye-Hand-Foot Coordination - Ability to use eyes, hands and feet simultaneously and in a coordinated manner.

¹³ The numbers of the work samples correspond to the number sequence given in "2.a. Name and Number of Work Samples."

- (12) Soldering and Inspection-Electronic - Soldering tasks of varying difficulty.
 - (13) Money Handling - Monetary concepts from recognition to consumer economics.
 - (14) Integrated Peer Performance - A group assembly and inspection task.
 - (15) Electrical Circuitry and Print Reading - Understands principles of electrical circuits and use of diagrams, etc.
 - (16) Drafting - Potential for drafting and blueprint reading.
 - (17) Pre-Vocational Readiness Battery - This is described as a separate work sample system on page 107.
 - (18) Conceptual Understanding Through Blind Evaluation (CUBE) - Assesses coping skills in meeting basic needs of mobility, judgment, orientation and balance.
 - (19) Dynamic Physical Capacities - Measures physical demands as defined by the U.S. Department of Labor publications.
- b. Grouping of Work Samples - The work samples were developed and are intended for use as individual components. They are not organized into a single, comprehensive evaluation system.
 - c. Manual - A separate manual is used for each work sample. Each contains sections on purpose, job classifications, work sample description, general administration and scoring, client instructions, rating directions, and normative data. A separate Evaluator's Manual contains sections on scoring, norms for each work sample as well as descriptions of the norm groups and methods. Most of the manual contents are detailed and easy to follow.

3. Physical Aspects

- a. Packaging of the Work Samples - All work samples are packaged separately and are self-contained. Where appropriate, work samples are contained in lockable cases.
- b. Durability - Components are well-constructed and durable, requiring little or no maintenance. One exception is the Money Handling work sample where problems with the dial can occur.
- c. Expendable Supplies - Most of the Valpar work samples require no expendable supplies. The few that do use expendable supplies use mainly paper forms.
- d. Replacement - All replacement parts can be ordered from Valpar. Forms may be reproduced locally or ordered from Valpar.
- e. Computer Requirements - This section is not applicable for the Valpar series.

4. Work Evaluation Process

- a. Preliminary Screening - The work samples do not require preliminary screening.
- b. Sequence of Work Sample Administration - The order and the number of work samples to be given is left to the discretion of the evaluator. It must be remembered that Valpar is a group of independent work samples and not a system.

- c. Client Involvement - Because work sample administration resembles a formal testing situation, client involvement is minimal; feedback on performance is left up to the discretion of the facility and individual evaluator.
- d. Evaluation Setting - The work samples can be used either in a classroom or workshop setting.
- e. Time to complete Entire System - It is estimated by the reviewer that most work samples can be completed in one hour or less. The Drafting, Integrated Peer Performance and Clerical Comprehension and Aptitude often take over one hour. Because the Pre-vocational Readiness Battery and CUBE have several sections, they often take four or more hours.

5. Administration

- a. Procedures - The materials required, evaluator instructions, and the layout are clearly described in the work sample manuals; detailed illustrations of the work sample are used to insure accuracy. All work samples recycle themselves so that they are ready for the next administration. Thus, little evaluation time is spent in disassembling completed tasks.
- b. Method of Instruction Giving - A combination of oral instructions with accompanying demonstrations is used by the evaluator to administer most work samples. Although the manuals imply that instructions are to be read verbatim, other Valpar literature and training indicates that they do not have to be read verbatim. In the Clerical Comprehension and Aptitude, Money Handling, and Drafting Work Samples, the client is required to read instructional and testing materials that simulate the tasks required in these three work samples.
- c. Separation of Learning/Performance - Eleven of the Valpar work samples have a formal practice period during which the client must reach an established criteria.
- d. Providing Assistance to the Client - The evaluator is encouraged to insure that the client has a thorough understanding of the task and demonstrate each task if, necessary, on those work samples without formal practice sessions before beginning timing. The manuals do not specify what (if any) assistance may be given to the client after timing has started.
- e. Repeating Work Samples - If desired by the evaluator, readministration is encouraged.

6. Scoring and Norms

- a. Timing - The evaluator times the client. On some work samples (e.g., Clerical Comprehensive and Aptitude), where there are several distinct tasks, each task is timed separately. The disassembly of many work samples is also timed. The manuals are specific as to when timing should begin and end.
- b. Timing Interval - Timing begins after the instructions have been given and ends when the task is completed. The typing test in Clerical Comprehension and Aptitude, Simulated Assembly and the endurance exercise in Dynamic Physical Capacities are exceptions.

- c. Time Norms - The completion time in seconds is recorded for each section of all work samples. The total time is converted into percentiles at 5% intervals; MTM standards also use percents as a conversion method.
- d. Error Scoring - Errors are well defined; the number of errors is recorded for each part of the sample and totaled. Total errors are converted to a percentile score. Valpar also uses a performance percentile score that is a combination of time and error scores. When appropriate, there are MTM error norms for all work samples.
- e. Scoring Aids - Use is made of scoring aids; some work samples have automatic scoring devices.
- f. Quality norms - Separate quality norms are used; errors are converted to percentiles in 5% intervals.
- g. Emphasis in Scoring - Present training by Valpar emphasizes the use of MTM standards over percentile scores.

7. Observation of Clients

- a. Work Performance - No work factors are specified for individual work samples.
- b. Work Behaviors - The same 17 worker characteristics (e.g., ability to work alone; ability to respond to change; ability to communicate; ability to make decisions) are defined in each work sample manual. There are no behaviors that are to be observed for each separate work sample. Most of these characteristics are not clearly defined and all require subjectivity on the part of the evaluator. Evaluators are instructed to rate only those characteristics "which are applicable to the client."
- c. Recording System - The evaluator uses a five-point scale to rate clients on each of the 17 worker characteristics.
- d. Frequency of Observation - Frequency of observation is not specified. However, frequent evaluator contact is required on many work samples due to the administration and scoring procedure.

8. Reporting

- a. Forms - A separate, standard form is included with each work sample for recording scoring information and rating worker characteristics. Body position charts are included with Upper Body Range of Motion, Whole Body Range of Motion and Dynamic Physical Capacities for recording pain and fatigue.
- b. Final Report Format - Because the work samples are not part of a unified system, no information or recommendations are given for reporting results in a unified manner.

9. Utility

- a. Vocational Exploration - There is limited opportunity for vocational exploration due to the abstract nature of some of the work samples.

- b. Vocational Recommendations - Because these are individual components and not an evaluation system, vocational recommendations cannot be made on the basis of one work sample. The use of the Valpar work samples for making vocational recommendations depends largely on their use in the individual evaluation unit.
- c. Counselor Utilization - Because the system uses the purchasing facility's or school's report format, counselor utilization cannot be specified.

10. Training in the System

- a. Training Required - Training is not required as a condition of purchase.
- b. Training Available - Training is available from Valpar International.
- c. Duration - Duration depends upon the needs of the evaluator.
- d. Follow-up - Follow-up after training is available on a consultation basis.

11. Technical Considerations

- a. Norms - Different work samples were normed on different samples; the norm groups used for each work sample are listed below:

<u>Norm Group</u>	<u>Work Sample</u>
(1) Adventitiously blind	1, 2, 4, 8, 9, 10, 18
(2) Air Force	2, 3, 6, 7, 8, 10, 11
(3) Community College	2, 3, 4, 6, 7, 8, 9, 10, 11
(4) Congenitally blind	1, 2, 4, 8, 9, 10, 18
(5) Congenitally deaf	1 through 12
(6) Employed Workers	2, 4, 6, 7, 9 & 11
(7) Independent Living	1, 2, 4, 6, 7, 8 & 11
(8) Methods Time Measurement-MTM	1 through 19
(9) Sheltered Living	1, 2, 4, 6, 7, 8 & 11
(10) Skill Center	1 through 12
(11) Unselected Employed	12

Sample sizes for each group range from 50 to over 500. All samples are clearly described. Means and standard deviations are given for time, error and performance scores for each group. Results are given in percentage performance scores for each group.

- b. Reliability - The test-retest reliability for each part of each work sample is given. The standard error of measurement was also computed. The reliability coefficients were generally very high. Because the methods used to gather and analyze the data are not given, no assessment can be made about the meaning of these data.
- c. Validity - Each manual contains short descriptions of the different types of validity. However, no data are available.

12. Reviewer's Summary and Comments

The Valpar Component Work Sample Series currently consists of 19 individual work samples that are physically well designed and constructed. They are appealing to clients and students and lend themselves to easy administration and scoring. Individual work samples can be easily incorporated into an existing evaluation or assessment program. Because the individual work samples can be purchased as needed by facilities or schools, there are no unified final report forms; other aspects of an integrated system are lacking.

One major problem with the Valpar series is in their relationship to jobs. According to the manuals, each component is keyed to a number of specific occupations as well as Worker Trait Groups. However, the manuals offer no convincing evidence that, for example, one work sample is related to ten Worker Trait Groups. A second problem is with the unknown validity of the series. Although very well designed, the series offers no objective evidence of having either construct, content, or empirical validity.

13. Address

Valpar International Corp.
P.O. Box 5767
Tucson, Arizona 85703-5767

14. Cost

<u>Component Work Sample</u>	<u>Cost</u>
Small Tools (Mechanical)	\$995.00
Size Discrimination	\$895.00
Numerical Sorting.	\$875.00
Upper Extremity Range of Motion	\$975.00
Clerical Comprehensive and Aptitude.	\$1,775.00
Independent Problem Solving	\$995.00
Multi-Level Sorting	\$1,125.00
Simulated Assembly.	\$1,375.00
Whole Body Range of Motion	\$1,295.00
Tri-Level Measurement	\$1,350.00
Eye-Hand-Foot Coordination.	\$1,125.00
Soldering and Inspection.	\$1,125.00
Money Handling	\$1,075.00
Integrated Peer Performance.	\$2,095.00
Electric Circuitry and Print Reading.	\$1,095.00
Drafting	\$995.00
Complete set of the above 16 work samples	\$19,165.00
CUBE	\$3,295.00
Dynamic Physical Capacities.	\$1,595.00
Adaptation kits to use 1, 2, 4, 8, 9 & 10 with visually impaired	\$225.00 each

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Vocational Evaluation System by Singer

(VES, New Concepts Corp./Singer Career Systems or Singer)

1. Development

- a. Sponsor - The system was developed by the Singer Educational Division, Career Systems. In October, 1985 the Career Systems products line, its patents and copyrights were purchased by the New Concepts Corporation.
- b. Target Group - According to the manual, "The VES is primarily intended for specific needs populations (e.g., socially and educationally disadvantaged, mildly retarded, physically handicapped) but may also be used with essentially normal populations. Those special needs groups who have limited reading ability, test poorly, and have a lack of occupational experiences..." In addition, many of the work samples can be adapted for deaf persons and for Spanish speakers. Thus, it appears that the Singer developers feel the system could be used with a wide range of rehabilitation, educational, and manpower populations.
- c. Basis of the System - Each work sample is based on a group of tasks contained in closely related jobs. The basis is a combination of job analysis procedures and the job descriptions contained in the fourth edition of the Dictionary of Occupational Titles.

2. Organization

- a. Name and Number of Work Samples - Presently the following 28 systems are available:
 - (1) Sample Making - Measures, cuts, drill, files, and finishes a ring.
 - (2) Bench Assembly - Attaches screws and bolts of various sizes to a metal block.
 - (3) Drafting - Draws concentric circles, produces isometric drawing, and draws cut dado block.
 - (4) Electrical Wiring - Makes, solders, and tapes three different splices.
 - (5) Plumbing and Pipe Fitting - Measures, cuts and reams galvanized and plastic pipe; fills out job order; installs a P-trap; assembles water lines; and repairs a faucet.
 - (6) Woodworking - Constructs a shelf using hand and power tools.
 - (7) Refrigeration and Air Conditioning - Measures, cuts and reams copper tubing; solders fittings; and follows simple service manual.
 - (8) Sales Processing - Completes a credit card sale; and takes and prepares telephone orders.
 - (9) Needle Trades - Threads and operates a power sewing machine to make a bag.
 - (10) Masonry - Mixes mortar and lays a corner of bricks.
 - (11) Sheet Metal - Lays out; cuts and bends using box and pan break; drills; and assembles a box.
 - (12) Cook and Baker - Follows directions to prepare brownies in a microwave.
 - (13) Engine Service - Disassembles engine and checks parts; changes oil; adjusts points and spark plug; and reassembles engine.

- (14) Medical Service - Applies elastic bandage to artificial arm; takes own temperature, pulse and respiration rate; determines liquid intake and output; and tests urine for sugar content.
- (15) Cosmetology - Cuts hair on a mannequin, rolls and pins hair; and shampoos, combs, and dries hair.
- (16) Data Calculation and Recording - Uses a calculator to compute the payroll and reconcile a quarterly report for 13 employees.
- (17) Production Machine Operating - Operates a simple injection molding machine to produce checkers.
- (18) Household and Industrial Wiring - Wires a light fixture, switch and outlet into a circuit; and attaches three-prong plug.
- (19) Filing, Shipping and Receiving - Files 100 cards alphabetically and numerically; compares purchase and packing slips; compares receiving and incoming orders; prepares packages for shipment; and files purchase orders.
- (20) Packaging and Materials Handling - Seals and packs boxes; wraps fragile items; bands cartons; and moves cartons.
- (21) Electronics Assembly - Constructs a wiring harness; selects and mounts components onto a printed circuit board; solders components and wiring harness to board.
- (22) Welding and Brazing - Runs puddles and beads; and joins two pieces of metal using the outside corner and butt weld with a gas torch.
- (23) Office Services - Takes, records and files simulated telephone messages; files letters and invoices; checks and proofreads; sorts incoming mail; and uses an electric typewriter.
- (24) Basic Laboratory Analysis - Determines acidity, nitrogen, phosphorous, potash and pH of soil samples.
- (25) Diesel Engine Service - Makes minor adjustments and services on a small diesel engine.
- (26) Auto Body Repair - Repairs a dented fender; mixes and applies body putty; and sands and primes fender.
- (27) Machine Trades - Sets-up, adjusts, and operates a small drill press and lathe.
- (28) Information Processing - Set-ups and operates a microcomputer; completes letter and number matching activities; and posts information from business documents.

b. Grouping of Work Samples - Each work station is independent.

c. Manual - Four basic manuals come with the work sample stations: Administration Manual, Technical Manual, Installation Manual and Behavioral Observation/Report Writing Manual. These manuals are supported by an audiovisual film strip series that enables the user to visually review each manual prior to the installation of the work sample stations. Each manual is very complete, well-planned and highly organized.

3. Physical Aspects

a. Packaging of the Work Samples - Each work station is self-contained in a carrel that can be closed and locked when not in use. Some larger pieces of equipment, such as the box-and-pan break and microwave oven are located outside the carrels.

- b. Durability - Because the Singer stations use fairly sophisticated tools and equipment, it is expected that there would be some problems with durability.
- c. Expendable Supplies - Many of the stations use a considerable amount of expendable supplies. For example, the Sheet Metal station requires two fairly large squares of metal, hinges, a latch and pop rivets. Other stations require wood, wire, fabric, and baking ingredients. Based on Singer price lists of January, 1984, the average price of expendable supplies is \$3.52 per work sample. The range is from \$0.33 to \$9.48.
- d. Replacement - All expendable supplies as well as most of the tools can be locally obtained. Other parts can be ordered from New Concepts Corp.
- e. Computer Requirements - The Information Processing work sample requires the use of a computer. However, because there are no computer requirements for overall system use, this section is not relevant.

4. Work Evaluation Process

- a. Preliminary Screening - No preliminary screening is required.
- b. Sequence of Work Sample Administration - The order and number of the work stations administered is left to the discretion of the evaluator.
- c. Client Involvement - The client is involved in the evaluation process through a series of self-ratings on interest and performance. Due to the frequent evaluator checkpoints in each work sample, the possibility for client contact with the evaluator is moderate to high. The manual does not specify if formal feedback is to be given to the client at the end of the evaluation process.
- d. Evaluation Setting - The use of carrels and audiovisual instructions creates a school-like atmosphere.
- e. Time to Complete the Entire System - The manual states that "a general rule of thumb is to allow two to two and one-half hours per job sample." Because any number of stations may be administered, no realistic estimates of the time to complete the total system can be given.

5. Administration

- a. Procedures - The tools and materials needed as well as set-up and maintenance are given in the manual for each work station. All client instructions are given on Auto-Vance equipment.
- b. Method of Instruction Giving - All instructions are given using an audio-cassette tape and filmstrip format with the client controlling the rate of advancement. Typically, the client or student hears several frames of instruction, then turns off the equipment, performs a specific task and then calls the evaluator to check that task. The linear programmed material is occasionally supplemented with written instructions. Additional evaluator instructions are discouraged because they would interfere with the standardization; evaluators are to record any type of re-instruction.

- c. **Separation of Learning/Performance** - There is very little separation of learning from performance in the Singer system. Most student instructions do not require a criteria to be reached before going on to repeat the task on a timed basis. On four of the stations, the client completes a product, has it checked by the evaluator, and then performs the task again without instructions on a speeded basis.
- d. **Providing Assistance to the Client** - The evaluator is encouraged to make sure that the student or client knows how to do the task before he/she begins to work. Checkpoints are provided in the audiovisual material so that the client can ask the evaluator to review his/her progress before continuing.
- e. **Repeating Work Samples** - Work samples may be repeated at the "request of the client who expresses a desire to try to improve his or her performance." The teacher or evaluator may have a work station repeated to assess changes in performance.

6. Scoring and Norms

- a. **Timing** - The client is timed by the evaluator. For each work station, the manual contains instructions at the frame numbers where the evaluator is to start and stop timing.
- b. **Timing Interval** - This interval varies with each work sample and is specified for each work sample in the manual. In many work samples, there are several timing intervals.
- c. **Time Norms** - All norms are based on the number of minutes to complete the work sample. Participant and/or employed worker norms are reported using a five-point rating scale based on the time score distribution for each work sample. Methods Time Measurement (MTM) norms are reported in 10% intervals, with the industrial normal being 100%.
- d. **Error Scoring** - All errors are carefully defined and each item (or the entire finished product) is checked against criteria. In using MTM standards for quality, each error is classified as major, intermediate, or minor.
- e. **Scoring Aids** - Some use is made of scoring aids.
- f. **Quality Norms** - Participant norms are reported using a five-point rating scale. Industrial norms and MTM quality norms are based on 100% with a specified number of percentage points subtracted for each of the three error levels.
- g. **Emphasis in Scoring** - Time and errors are given equal weight.

7. Observation of Clients

- a. **Work Performance** - Twenty work factors (e.g., attention span, form discrimination, neatness, and use of hand tools) are defined. Each work sample has a separate Task Observation Record containing specific factors for each task. For example, in the part of the Drafting Work Sample that "compares drawings with models provided," the evaluator is to observe "following a model, inspection and checking, retention."

- b. **Work Behaviors** - No work behaviors are listed.
- c. **Recording System** - Work performance factors are listed on the Task Observation Record; the evaluator does not rate behaviors, he/she records the observations. A Work Activity Rating Form is used by the client to rate his/her interests in a work station before and after performing the tasks; the client and evaluator also rate the client's performance on a five-point scale at the end of the work sample. This rating is general and does not include separate ratings for work factors.
- d. **Frequency of Observation** - The manual lists frequent evaluator check and assistance points to allow the evaluator to make numerous observations at each station.

8. Reporting

- a. **Forms** - Forms include the Task Observation Record, Work Activity Rating Form, MTM Rating Form, Industrial Rating Form and a summary sheet for time and quality scores.
- b. **Final Report Format** - While the manual does not contain any recommended final report format, it does contain a description of what should be contained in a final report.

9. Utility

- a. **Vocational Exploration** - An extensive amount of occupational information is provided the student or client. Each work sample contains an introduction to some jobs related to that work station. Many schools and rehabilitation facilities use the Singer primarily as an interest and career exploration device.
- b. **Vocational Recommendations** - Because the system contains no final report format, these would be dependent on the user.
- c. **Counselor Utilization** - For the reason given immediately above, this can be judged.

10. Training in the System

- a. **Training Required** - No.
- b. **Training Available** - Yes.
- c. **Duration** - Two day, one week or two week VES workshops are offered on a regional level on a fee basis.
- d. **Follow-up** - New Concepts regional managers conduct follow-up visits with charge. Technical consultations may be scheduled through the home office.

11. Technical Considerations

- a. Norm Base - Each unit contains three types of norms: participant or client, employer worker, and MTM. Many norm groups are of adequate size; sample characteristics are thoroughly described.
- b. Reliability - A study by Cohen and Drugo (1976) reported test-retest reliability coefficients of .61 and .71 for an EMR population.
- c. Validity - VES bases its validity on several sources. First, the content validity of the job-task matrix and of the job analysis for each work sample. The job-task matrix relates specific tasks to specific jobs and identifies which tasks are included in the work sample. The average work station covers about 65% of the tasks given in the matrix. Second, two predictive studies (Gannaway and Sink, 1972; Monroe County, n.d.) attempted to relate work sample scores with success in jobs related to the work samples. While these studies have methodological problems, the significant results are encouraging. Third, a study by Sink et al. (1976) revealed that the system encouraged users to seek additional occupational information.

12. Reviewer's Summary and Comments

The VES or Singer is intended for use mostly as an occupational exploration system. Instead of attempting to produce work samples directly related only to one job, each work station relates to several jobs having common tasks. This results in work samples that are much more versatile, especially for occupational exploration. Each station includes several visuals showing the relationship of the work station to many specific jobs.

Physically the stations are well-designed. They are self-contained and the audio-visual instructions move the client or student through each work sample at a slow pace. The tasks comprising each work sample offer a variety of experiences. Finally, the documentation for the system is thorough.

Although there needs to be additional validation studies, the ones cited above are a small beginning. The major problems are the lack of a work atmosphere, which cannot help but detract from the occupational exploration purpose of the system, the amount of expendable supplies, and the possible need for a general framework to integrate the individual units into one system.

13. Address

For general information contact the Marketing Division at:

New Concepts Corporation
1161 N. El Dorado Place
Suite 343
Tucson, Arizona 85715

For ordering and technical support contact:

New Concepts Corporation
1802 N. Division Street
Morris, Illinois 60450

14. Cost

The cost per work station ranges from \$1,659.00 to \$3,439.00. The average cost is \$2,104.00. All prices are F.O.B. Morris, IL. Each work station includes enough supplies to evaluate approximately 30 people.

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Patten, D. (1973). A reaction to industry produced evaluation systems. Vocational Evaluation and Work Adjustment Bulletin, 6(2), 33-35.

Sink, J. M., Field, T. F., & Gannaway, T. W. (1976). An assessment of the Singer Vocational Evaluation System as a catalyst for occupational information seeking behaviors. Rochester, NY: Singer Educational Division, Career Systems.

Vocational Information and Evaluation Work Samples

(VIEWS)

1. Development

- a. Sponsor - The VIEWS was developed by the Vocational Research Institute of the Philadelphia Jewish Employment and Vocational Service.
- b. Target Group - The system is especially designed for moderate and severely mentally retarded adults.
- c. Basis of the System - The VIEWS is based on six Worker Skill Groups falling within four Data, People, Things, (DPT), levels of the fourth edition of the Dictionary of Occupational Titles. These levels were chosen because they represent the most common areas of training and employment for mentally retarded persons.

2. Organization

- a. Name and Number of Work Samples - The 16 work samples are organized according to Worker Skill Group.¹⁴ These groups are Vocational Research Institute constructs which represent a class of exercises involving similar task demands.
 - (1) .687 - Materials Sorting includes: #1 Title Sorting, #2 Nuts, Bolts & Washers Sorting, #8 Valve Disassembly; Clerical Matching & Counting includes: #5 Stamping, #10 Mail Sort, #11 Mail Count; Assembling includes: #4 Collating & Stapling, #6 Nut Weighing, #7 Nut, Bolt & Washers Assembly, #9 Screen Assembly.
 - (2) .686 - Machine Feeding - #12 Machine Feeding
 - (3) .685 - Routine Tending - #3 Paper Cutting, #16 Drill Press
 - (4) .684 - Fabricating - #13 Budgette Assembly, #14 Valve Assembly, #15 Circuit Board Assembly
- b. Grouping of Work Samples - The work samples are grouped according to the DPT levels listed above.
- c. Manual - The manual contains the following information for each work sample: demonstration, setup, training, production and norms. A photograph is used for each work sample to insure proper setup. The use of the recording forms, report forms, etc., is not covered in the manual. These are dealt with during training.

3. Physical Aspects

- a. Packaging of the Work Samples - Fourteen work samples are individually packaged in portable plastic cabinets. The Drill Press and Machine Feeding Work Samples are permanently mounted on a sturdy worktable.

¹⁴ As in the DOT, the first digit beyond the decimal point represents Data level, the second People, and the third Things.

- b. Durability - The plastic cabinets as well as the components for each work sample appear to be very durable.
- c. Expendable Supplies - Three different colors of 8 1/2 by 11 paper, string, and fiberboard squares are the only expendable supplies used. These all can be purchased locally.
- d. Replacement - In order to insure standardization, all replacement parts should be ordered from the developer.
- e. Computer Requirements - Not applicable.

4. Work Evaluation Process

- a. Preliminary Screening - No preliminary screening is required.
- b. Sequence of Work Sample Administration - The work samples are given from least complex to most complex. Each work sample has three phases: (1) Demonstration - the evaluator follows the manual to provide an oral description and a physical demonstration for the client; (2) Training - the client is trained to a predetermined criterion of mastery on each work sample--during this phase the evaluator is free to use a wide variety of techniques to make certain that the client learns the task; and (3) Production - after the criterion have been achieved, the client is assigned a set number of cycles of the work sample to perform independently. The purpose in separating the training and production phases is to make sure that the client has learned each task before he performs it.
- c. Client Involvement - There is extensive client involvement. In the training phase for each work sample, the evaluator and the client have a significant amount of interaction during the learning process. The Evaluator's Handbook calls for an informal client feedback session after the first day as well as on subsequent days when needed.
- d. Evaluation Setting - A realistic work atmosphere and setting are stressed in the Handbook and during evaluator training.
- e. Time to Complete the Entire System - The developer estimates that the VIEWS can be administered in from four to seven, five hour days (i.e., 20 to 35 hours).

5. Administration

- a. Procedures - The Handbook contains all details necessary for administration. A photograph of each work sample is used to insure proper layout. The instructions for the demonstration phase are given in detail and include both oral and physical directions. The training phase criteria are clearly given.
- b. Method of Instruction Giving - No reading is required of the client for any work sample. The demonstration phase uses oral instructions plus modeling. During the training phase the evaluator is free to use a variety of verbal and nonverbal techniques; flexibility is stressed here. Because each work sample is individually administered, the client can receive instructions using the methods which best meet his needs.

- c. **Separation of Learning/Performance** - As stated above, the VIEWS separates learning and performance by having a formal training period for each work sample. Here the evaluator is free to use almost any teaching technique that will result in the client reaching the established criteria. For example, the criterion for the Valve Disassembly Work Sample is: "Two valves consecutively disassembled and sorted without error."
- d. **Providing Assistance to the Client** - Extensive assistance is provided during the training phase; little is given during the production phase. If help is needed during the production phases, the evaluator is to record this on the appropriate behavior observation form.
- e. **Repeating Work Samples** - The VIEWS does not place much emphasis on repeating work samples; it is designed so that the client should have learned the task before the performance phase. However, work samples may be repeated if considered necessary by the evaluator.

6. Scoring and Norms

- a. **Timing** - The evaluator use a time stamp machine to time the client.
- b. **Timing Interval** - Timing on each work sample begins when the client enters the production phase and ends with the completion of the task.
- c. **Time Norms** - Time results are rated on a three-point scale based on the number of minutes to completion. Predetermined time standards using the MODAPTS approach are also available.
- d. **Error Scoring** - Each work sample is checked against carefully defined quality standards. No random check is made; the entire work sample is scored.
- e. **Scoring Aids** - Some use is made of scoring aids.
- f. **Quality Norms** - The total number of errors for each work sample are converted to a three-point rating scale. The system also contains rate-of-learning norms for use during the training phase.
- g. **Emphasis in Scoring** - Time and quality are both given equal weight in the VIEWS.

7. Observation of Clients

- a. **Work Performance** - Ten work performance factors (e.g., color discrimination, finger dexterity, work rhythm) are carefully defined. In addition to these definitions, specific definitions of the factors are made for each work sample. For example, in the Title Sorting Work Sample, finger dexterity is assessed by "picking up tiles with fingers," in the Stamping Work Sample, it is "turning pages; picking up stamps." Each work sample has several factors listed that are to be observed. The accurate recording of behavioral observations is emphasized.
- b. **Work Behaviors** - Work behaviors such as attendance and punctuality, response to training, and communication are clearly defined and observed during the course of the day.

- c. **Recording System** - Work behaviors and performance factors are written, as they are observed, on a client record form. Specific behaviors are reported on the forms; no rating system is used.
- d. **Frequency of Observation** - The VIEWS uses extensive observations. Observation of defined work factors is required for each work sample. Work behavior observations are to be made constantly.

8. Reporting

- a. **Forms** - The system uses four types of standardized forms: (1) a client record form for recording training observations, performance observations, behavioral observations, and errors (there is a separate page of this form for each work sample); (2) a daily observation form for summarizing work behaviors and performances; (3) a final report form, and (4) a profile sheet.
- b. **Final Report Format** - The VIEWS final report uses a standardized format to present information on the following: general observations, interpersonal relations, training, worker characteristics, recommendations, and a profile sheet containing work sample results including the industrial time standards for the work samples. Recommendations are given for training techniques, Work Groups, and for other services that may be required.

9. Utility

- a. **Vocational Exploration** - Since the tasks are work samples and not actual jobs and because almost no occupational information is provided, the VIEWS is of little use in occupational exploration.
- b. **Vocational Recommendations** - Specific recommendations are made; these are related to the six Worker Skill Groups and from DPT levels covered by the VIEWS.
- c. **Counselor Utilization** - The system and the final report are oriented toward the counselor.

10. Training Required

- a. **Training Required** - Yes
- b. **Training Available** - Yes
- c. **Duration** - One week in Philadelphia for new users. Under certain conditions, regional training is available.
- d. **Follow-up** - Not available

11. Technical Considerations

- a. **Norm Base** - The VIEWS was renormed in 1979 on 452 mentally retarded persons (mean. IQ = 53) between the ages of 15 and 61. All data are reported only in terms of the 1-2-3 ratings. No means and standard deviations are given for the time and error scores for any of the work samples. MODAPT'S predetermined time standard norms are also available.

b. Reliability - No data presently available.

c. Validity - No data presently available.

12. Reviewer's Summary and Comments

The VIEWS attempts to evaluate the vocational potential of mentally retarded adults for jobs in four DPT levels. The system relates to job areas that are very common in the national economy and more important to the job areas where many retarded persons have found successful employment. The most unique feature of the system is the attempt to separate learning from performance. The developers believe that the client should first be thoroughly taught the task prior to performing it under timed conditions. The VIEWS also uses standardized behavior observations which are combined with time and quality scores to produce a well organized final report. One problem with using the VIEWS by itself is the lack of occupational information. The system has unknown reliability and validity; these are the most critical problems with the VIEWS.

13. Address

Vocational Research Institute
Jewish Employment and Vocational Service
2100 Arch Street, 6th Floor
Philadelphia, Pennsylvania 19103

14. Cost

\$9,950.00 includes: work samples, manuals, forms, and tuition for training two persons in Philadelphia. Living expenses and transportation are not included in the price.

15. References

Backer, T. E. (1979). Client assessment: A manual for employment and training agencies. Los Angeles, CA: Edward Glaser & Associates.

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Vocational Interest Temperament and Aptitude System

(VITAS)

1. Development

- a. **Sponsor** - The VITAS was developed by the Philadelphia Jewish Employment and Vocational Service under contract with the Manpower Administration. The system was originally designed for use within the U.S. Employment Service. JEVS is presently marketing the system to schools, rehabilitation centers and manpower programs.
- b. **Target Group** - According to the manual, "VITAS is designed for educationally and/or culturally disadvantaged persons of both sexes. The system is not intended for individuals with more than a 12th grade education, the physically handicapped, or the mentally retarded." This reviewer, however, believes that the VITAS could be used with many physically handicapped persons and mildly retarded persons.
- c. **Basis of the System** - The VITAS is based on 16 Work Groups in the Guide for Occupational Exploration (GOE). These were selected because of employment and/or training opportunities.

2. Organization

- a. **Name and Number of Work Samples** - The 16 Work Groups are assessed by 21 separate work samples listed below. (Note that several of the work samples assess for more than one work group.)
 - (1) 02.04 - Laboratory Technology - #4 Collating Material Samples, #8 Nail & Screw Sorting (Part I); #8 Nail & Screw Sorting (Part II); and #20 Laboratory Assistant
 - (2) 05.03 - Engineering Technology - #21 Drafting
 - (3) 05.05 - Craft Technology - #11 Lock Assembly, #19 Spot Welding and #21 Drafting
 - (4) 05.09 - Materials Control - #2 Packing Matchbooks, #3 Title Sorting and Weighing, #5 Verifying Numbers, #8 Nail & Screw Sorting (Part II)
 - (5) 05.10 - Crafts - #7 Budget Book Assembly, #8 Nail & Screw Sorting (Part I), #9 Pipe Assembly, #11 Lock Assembly
 - (6) 05.12 - Elemental Work: Mechanical - #1 Nuts, Bolts & Washers Assembly, #2 Packing Matchbooks and #6 Pressing Linens
 - (7) 06.01 - Production Technology - #8 Nail & Screw Sorting (Part I), #11 Lock Assembly, #12 Circuit Board Inspection, #19 Spot Welding, #20 Laboratory Assistant, and #21 Drafting
 - (8) 06.02 - Production Work - #1 Nuts, Bolts & Washers Assembly, #6 Pressing Linens, #7 Budget Book Assembly, and #9 Pipe Assembly
 - (9) 06.03 - Quality Control - #3 Title Sorting and Weighing, #4 Collating Material Samples, #8 Nail & Screw Sorting (Part I), #12 Circuit Board Inspection
 - (10) 06.04 - Elemental Work: Industrial - #1 Nuts, Bolts & Washers Assembly, #2 Packing Matchbooks, and #6 Pressing Linens
 - (11) 07.02 - Mathematical Details - #8 Nail & Screw Sorting (Part II), #13 Calculating, #15 Bank Teller, and #17 Payroll Computation

- (12) 07.03 - Financial Detail - #8 Nail & Screw Sorting (Part II), #13 Calculating, #15 Bank Teller, #17 Payroll Computation, and #18 Census Interviewing
 - (13) 07.04 - Oral Communications - #14 Message Taking and #18 Census Interviewing
 - (14) 07.05 - Records Processing - #5 Verifying Numbers, #10 Filing by Letters, and #16 Proofreading
 - (15) 07.06 - Clerical Machine Operation - #13 Calculating and #14 Message Taking
 - (16) 07.07 - Clerical Handling - #2 Packing Matchbooks, #3 Tile Sorting and Weighing, #10 Filing by Letters
- b. Grouping of Work Samples - Each work sample is independent in terms of administration and scoring. The results are combined and interpreted as part of the above listed classifications. Work samples are also related to work groups.
 - c. Manual - The manual contains the following information on each work sample: (1) inventory; (2) administration notes; (3) demonstration/instructions, and (4) scoring procedures. A photograph is used for each work sample to insure proper setup. Although examples of report forms and definitions of the aptitude codes are given in the manual, there are no instructions on how to use these items. These are covered during training.

3. Physical Aspects

- a. Packaging of the Work Samples - All work samples are packaged independently. Most of the work samples are packaged in plastic containers that could easily be stored when not in use. The only heavy piece of equipment is the spot welder.
- b. Durability - The VITAS uses mostly basic tools and equipment that should be very durable. According to the developers, no problems have been reported.
- c. Expendable Supplies - The VITAS uses expendable items such as: paper and recording forms, string, and sheet metal. All supplies can be locally obtained. While there are no estimates, the cost per client administration is low.
- d. Replacement - All replacement parts should be ordered from the developer in order to maintain standardization.
- e. Computer Requirements - Not applicable

4. Work Evaluation Process

- a. Preliminary Screening - No preliminary screening is necessary.
- b. Sequence of Work Sample Administration - The client usually begins with the least complex work sample (i.e., Nuts, Bolts and Washers Assembly) and progresses to the more complex (i.e., Drafting). However, the work samples can be given in any order.
- c. Client Involvement - The client is involved in the vocational process at several different times: (1) new clients are given an orientation session when

first coming into the evaluation unit; (2) a group motivational session at the end of the first day of evaluation; and (3) a feedback and interest interview after the work samples are administered.

- d. Evaluation Setting - The VITAS manual stresses a realistic work setting.
- e. Time to Complete the Entire System - According to the manual, "most clients can complete the work sample within three, five-hour days," or about 15 hours.

5. Administration

- a. Procedures - A photograph showing the correct arrangement of parts is given to insure proper setup of each work sample. The instructions for the demonstration part of the work sample are brief and to the point; these include both oral and physical directions. For each work sample, a section called "Administration Notes" contains additional items for setup and any special instructions that are to be followed by the evaluator during the client demonstration.
- b. Method of Instruction Giving - Client instructions are given orally in all cases and in some cases by demonstration. While the client is not required to read any administration instructions, reading and the use of mathematical skills are needed to successfully complete six of the work samples.
- c. Separation of Learning/Performance - Nine of the VITAS work samples do not have a separate practice period. After the evaluation instructions and demonstrations are completed and any client questions answered, the client begins the task. No criteria are used to establish that the client has learned the task. For all practical purposes, there is no separation of learning from performance.
- d. Providing Assistance to the Client - "When a client has a question or seeks assistance, the evaluator may repeat the necessary part of the instructions, including a re-demonstration, but should never do part of the task for the client. Only a minimum amount of assistance should be given so as to encourage the clients to do as much as they can on their own." Thus, when administering a work sample, the evaluator gives the instructions and demonstration and does not offer any additional explanations unless requested.
- e. Repeating Work Samples - Re-administration of work samples is not recommended. However, clients are urged to complete a task as best they can once they begin.

6. Scoring and Norms

- a. Timing - The evaluator uses a time stamp machine to mark the starting time on a slip of paper; at the completion of the work sample, the client stamps his/her own slip.
- b. Timing Interval - Timing begins when the evaluator completes the instruction phase of the work sample and ends when the client completes the task.

- c. Time Norms - The minutes to completion are converted to 1-2-3 rating. No percentile or standard scores are used.
 - d. Error Scoring - All work samples have carefully defined scoring procedures in which errors are clearly described (e.g., "Number of books with string not tied in a bow.") No random samples are used; the entire work sample is checked. The frequency of each type of error is recorded.
 - e. Scoring Aids - Extensive use is made of scoring aids such as templates, overlays, coding systems, and measuring instruments.
 - f. Quality Norms - The errors are converted to a three-point quality rating. As with the time scores, no percentile or standard scores are used.
 - g. Emphasis in Scoring - Both time and errors are given equal weight.
7. Observation of Clients
- a. Work Performance - The VITAS manual describes nine work performance factors (i.e., aptitudes). The definitions of the factors (e.g., spatial, clerical perception, color discrimination) are taken from the DOT definitions. Specific definitions of each aptitude are related to each appropriate work sample. Thus, in the Packing Matchbook Work Sample, Manual Dexterity, Aptitude is observed as "Transferring matchbooks from bin to tray; handling trays." While in the Tile Sorting and Weighing Work Sample, Aptitude is observed by picking up boxes. Each work sample has from two to seven aptitudes that are to be observed. The close and accurate observation of client behaviors is stressed.
 - b. Work Behaviors - General observations are to be made on attendance, punctuality, verbal ability, interpersonal behavior, and general worker characteristics. These are to be observed and recorded throughout the working day.
 - c. Recording System - No rating or checklist system is used; specific behaviors for each work sample are recorded on a separate form for that work sample.
 - d. Frequency of Observation - While the manual contains no specific instructions as to when and how often to observe behavior, the system stresses the almost constant observation of client behavior.
8. Reporting
- a. Forms - The system uses five types of standardized forms: (1) a Work Sample Record Form for recording; aptitude and behavior observations, types of errors, and time and error scores (there is a separate page of this form for each work sample), (2) a general observation form, (3) a final report form, (4) a Vocational Interest Interview Form, and (5) a profile sheet.
 - b. Final Report Format - A four page final report form uses a standardized format to present information on the following: Physical description; attendance and punctuality, verbal ability, interpersonal behavior, skills, vocational recommendations by Work Groups, recommendations for supportive services, and profile of all work sample time and quality ratings.

9. Utility

- a. Vocational Exploration - The VITAS is of limited use for providing the client with occupational information. The nature of many of the tasks is abstract and no job information is provided during the instruction period for each work sample. However, the manual states that occupational/vocational information should be used as a supplement to the VITAS.
- b. Vocational Recommendations - Recommendations are made in two specific areas: (1) the most feasible Work Groups for employment or training and (2) specific supportive services needed to obtain the employment goal. Apparently, recommendations within each work group are kept general - no specific jobs are suggested.
- c. Counselor Utilization - The final report is aimed at the counselor who needs to make fairly specific vocational decisions.

10. Training in the System

- a. Training Required - Yes
- b. Training Available - Yes
- c. Duration - A one-week training session is held in Philadelphia. Regional training is available under certain conditions.
- d. Follow-up - Not available

11. Technical Considerations

- a. Norm Base - There are two norm groups for the VITAS. The 1980 norms contained results on a sample size of about 325 persons. The sample is clearly described--63% female, white 63%, median age - 25 years and 35% 12th grade education. The 1981 secondary school norms have about 220 cases for each work sample. The mean age is 15.2 years, white - 78%, male - 68% and 67% learning disabled. Time and error scores are converted to a 1-2-3 rating system. No employed worker or predetermined time standard norms are given.
- b. Reliability - No data are available.
- c. Validity - No data are available. The manual makes reference to "face" validity as a criterion and then confuses this with content validity.

12. Reviewer's Summary and Comments

The VITAS System is the third work sample system developed by Philadelphia JEVS. Like the JEVS and VIEWS systems, it stresses the importance of careful and accurate behavior observations. The system also uses the work sample to work group approach that has served JEVS so well in the past. It must also be pointed out that many of the VITAS work samples are refinements and modifications of the original JEVS system. While the system could provide accurate assessment of CETA populations in a relatively short period of time, it has three problems: (1) a lack of client occupational information, (2) the failure to make any real distinction between learning and performance, and (3) the lack of any

reported reliability and validity data. The emphasis upon close client contact, careful observations, and the practical reporting format are the three major advantages of the system.

13. Address

Vocational Research Institute
Jewish Employment and Vocational Service
2100 Arch Street, 6th Floor
Philadelphia, Pennsylvania 19103

14. Cost

\$9,950.00 includes work samples, manuals, forms, and tuition for training one person in Philadelphia. Living expenses and transportation for the evaluator are not included in the price.

15. References

Abrams, M. (1979). A new work sample battery for vocational assessment of the disadvantaged VITAS. Vocational Guidance Quarterly, 28(1), 35-43.

Harris, J. (1980). Final report: VITAS work samples assessment as part of the Job Service demonstration project for out-of-school youth. (U.S. DOL contract #20428020).

Sankowsky, R. (1975). Evaluating rehabilitation potential of the severely handicapped: Vocationally related components. Institute, WV: West Virginia Rehabilitation Center, Research and Training Center.

Zimmerman, B. (1979). VITAS. In A. Sax (Ed.), Innovations in Vocational Evaluation and Work Adjustment. Vocational Evaluation and Work Adjustment Bulletin, 12(1), 29-31.

Wide Range Employability Sample Test

(WREST)

1. Development

- a. Sponsor - The WREST was refined and is marketed by Jastak Associates.
- b. Target Group - The original work samples were aimed at supplementing the assessment of mentally retarded and physically handicapped persons in a sheltered workshop. According to the manual "it is particularly appropriate for day activity centers, sheltered workshops, special education facilities, and other programs whose participants include mentally retarded, cerebral palsied, and other severely physically, mentally, and socially handicapped." Its primary use is with persons for whom competitive employment of any kind is in doubt.
- c. Basis of the System - The WREST is based on a group of work samples originally developed at a sheltered workshop in Wilmington, Delaware for "referral of handicapped individuals who may be trained in basic work production skills." The work samples were used in conjunction with other techniques to train and select persons for various areas of the workshop.

2. Organization

- a. Name and Number of Work Samples - There are ten work samples; the first two have two parts:
 - (1) Folding - Folds a single page and double folds, glues, labels and stuffs envelope.
 - (2) Stapling - Stapling accuracy and collation and stapling.
 - (3) Packaging - Places 8 pegs by color in a small plastic container.
 - (4) Measuring - "Filling plastic containers with small grains of colored plastic to a specific line."
 - (5) Stringing - Runs lacing through a card to form a loop.
 - (6) Gluing - Accurately glues paper swatches to lines.
 - (7) Collating - "Picking one sheet at a time and placing it in proper order."
 - (8) Color Matching - Arranges colored swatches to match a sample sheet.
 - (9) Pattern Matching - "Placing colored pegs in a block to replicate patterns."
 - (10) Assembling - "Assembling assorted screws, washers, and nuts on a board to match a sample."
- b. Grouping of Work Samples - Each work sample is independent.
- c. Manual - The single manual contains the following major areas: (1) history, (2) theory, (3) general administration guidelines, (4) work sample instructions, (5) scoring, (6) technical considerations, and (7) case histories. The general administration section is highly detailed as well as useful. The instructions for each work sample are well organized and easy to follow. A photograph is used for each work sample to insure proper layout.

3. Physical Aspects

- a. Packaging of the Work Samples - The work samples, manuals, supplies, and scoring forms are shipped in cardboard cartons.
- b. Durability - All work samples are made of heavy (mostly clear) plastic. The containers should be durable; however, the user should expect some wear of the pegs, tags, and colored pieces.
- c. Expendable Supplies - Besides forms, typing paper, stickers, and colored paper swatches are the most common expendable supplies. These are inexpensive and locally available. The developer also sells a resupply kit.
- d. Replacement - Replacement parts can be ordered from the developer.
- e. Computer Requirements - Not applicable.

4. Work Evaluation Process

- a. Preliminary Screening - No preliminary screening is required.
- b. Sequence of Work Sample Administration - The 10 work samples may be administered in any order. However, most evaluators "will find it more convenient to follow the designated order."
- c. Client Involvement - The manual stresses that the client(s) should be told what the work samples involve and how the results will be used. The need for individualized attention is also mentioned. There is, however, no statement in the manual on providing feedback after specific work samples.
- d. Evaluation Setting - The evaluation setting would most likely be that of a formal testing situation.
- e. Time to Complete the Entire System - Administration time for individual clients is about one and a half hours; small groups of three to five persons take about two hours.

5. Administration

- a. Procedures - For each work sample, the manual describes the purpose, and gives the materials, scoring information and instructions. A photograph is used to ensure proper layout. The WREST can be administered to small groups of three to six persons. Duplicate sets of the WREST are necessary for group administration.
- b. Method of Instruction Giving - All instructions are oral and demonstration; no reading is required. The manual warns that instructions must be closely followed: "any change from the manual may cause confusion, thus invalidating the norms of that test."
- c. Separation of Learning/Performance - Each work sample contains a practice period prior to the start of timing. While there are criteria for most work samples (e.g., In Assembling, five practice items must be correct), the evaluator may use additional practice items if necessary to make sure that the

client understands the instructions. Thus, there is a separation of learning from performance.

- d. **Providing Assistance to the Client** - The manual clearly states that "once the formal testing has begun, no help can be given, but all possible assistance should be given during the instruction and practice preceding the formal testing."
- e. **Repeating Work Samples** - Readministration of work samples is emphasized for upgrading. Evaluators are encouraged to keep accurate records of all readministration.

6. Scoring and Norms

- a. **Timing** - The evaluator times the client(s) using a stopwatch or other timing device.
- b. **Timing Interval** - Timing is started after the client(s) understand(s) the task and continues for a set period of time, which is different for each task. The time needed to complete each work sample is recorded in minutes and seconds.
- c. **Time Norms** - The number of minutes and seconds recorded are compared to scaled scores ranging from 0 through 19. The scaled scores can also be compared to standard scores.
- d. **Error Scoring** - All completed parts are checked against the clearly defined scoring criteria given in the manual.
- e. **Scoring Aids** - No use is made of scoring aids.
- f. **Quality Norms** - The errors for all ten work samples are added together and the total compared to norm tables.
- g. **Emphasis in Scoring** - The time results are emphasized.

7. Observation of Clients

- a. **Work Performance** - The manual states that the evaluator should be familiar with the dexterity and perceptual aptitudes as defined in the DOT. However, no instructions are given for making, recording, and using these observations.
- b. **Work Behaviors** - Ten general work behaviors (e.g., appearance, perseverance, organization of work, and safety practices) are defined in the manual. These are not defined in behavioral terms. There is a space on the Summary Profile for rating each behavior category.
- c. **Recording System** - Each behavior is rated on a scale from one to 18. Verbal descriptions of from "very poor" to "very good" are used in conjunction with the numbers. There is no explanation of how these ratings are to be obtained; there is almost no room on the form for recording actual observations.
- d. **Frequency of Observations** - This is not specified in the manual.

8. Reporting

- a. Forms - A single, two page form is used to record all raw scores and to report the converted scores, as well as the "behavior" observations. The second page of the form contains space for a work history and "summary and recommendations."
- b. Final Report Format - A variety of reporting formats are illustrated in the manual. These show examples of final reports which incorporate a wide variety of data from other sources. The WREST was not intended to be used independently of other methods of assessment.

9. Utility

- a. Vocational Exploration - The very simple nature of most of the work samples makes the WREST of little use in job exploration for a normal population.
- b. Vocational Recommendations - The manual contains no information on the making of vocational recommendations from the work sample results.
- c. Counselor Utilization - The manual contains no information on use of WREST results for the counselor.

10. Training in the System

- a. Training Required - No training is required prior to purchase or use.
- b. Training Available - No formal training is available.
- c. Duration - Not applicable.
- d. Follow-up - Not applicable.

11. Technical Considerations

- a. Norm Base - Time and quality norms are available on three major groups: (1) general population, (2) sheltered workshop employees, and (3) competitively employed workers. The general population group is further broken down into six age groups and by sex. In the workshop and industrial groups, ages and sex were combined when it was discovered that there was little significant differences within these general groups. Norm groups are well defined and sample sizes range from 200 for individual groups to 4000 for large groups. All samples were collected in the State of Delaware.
- b. Reliability - Test-retest reliability coefficients for time and error scores on the ten work samples were calculated using 428 employed workers over a three month period. All correlations were in the .90's. A second study on a very small sample (N=15) repeated the WREST three times over a period of a few weeks; the correlations were in the high .80's and low .90's. These results are a strong indication of the test-retest reliability of the WREST.
- c. Validity - Validity is based on two correlations between supervisor's ratings and time and error standard scores for 428 employed workers. The WREST correlated .86 (time) and .92 (quality) with the ratings. These correlations

are extremely high; so high in fact that the manual advises that "extreme caution must be used in regarding such studies as the above as valid measures of test validity." Nevertheless, the results are encouraging.

12. Reviewer's Summary and Comments

The WREST consists of ten, short, low-level tasks apparently designed to assess mainly the manipulation and dexterity abilities of the client. Although it is not stated in the manual, the WREST seems most useful in assessing new clients for assignment to suitable work projects within a sheltered workshop. The emphasis upon repeating the work samples many times should provide an evaluation of the client's ability to improve his performance under repeated practice conditions. The major problems of the system center around the lack of systematic behavior observations, failure to relate results to the competitive job market, and the apparent lack of a usable final report for referring counselor or agency. Finally, the WREST has an adequate norm base, good estimates of test-retest validity, and an attempt at establishing concurrent validity. In a field that is all too often characterized by poor technical development, the WREST can serve as a good example.

13. Address

Jastak Associates, Inc.
1526 Gilpin Avenue
Wilmington, Delaware 19806

14. Cost

Work Sample Kit	\$750.00
Manual.	\$ 27.50
Resupply Kit.	\$120.00
Record Forms (50)	\$ 10.50

15. References

- Botterbusch, K. (1973). Wide Range Employment Sample Test. In A. Sax (Ed.), Innovations in vocational evaluation and work adjustment. Vocational Evaluation and Work Adjustment Bulletin, 6(2), 40-43.
- Jastak, J. F., & Jastak, S. (1979). Meanings and measures of mental tests. Wilmington, DE: Jastak Associates.
- Morley, R. (Ed.). (1973). Vocational assessment systems. Des Moines, IA: State of Iowa, Department of Public Instruction.
- Timmerman, W. J., & Doctor, A. C. (1974). Special applications of work evaluation techniques for prediction of employability of the trainable mentally retarded. Stryker, OH: Quadco Rehabilitation Center, Inc.

Work Skill Development Package

(WSD)

1. Development

- a. Sponsor - The WSD was developed by Mr. Donald Bastian of the Attainment Company.
- b. Target Group - The package is designed to develop basic or pre-vocational work skills in severely mentally retarded, mentally ill and/or physically disabled persons. Apparently, the system is intended for use in special education as well as vocational rehabilitation facilities. According to the developers, the system has four major applications: (1) the assessment of a baseline of performance and of subsequent progress, (2) the acquisition of skills needed to successfully complete a task, (3) production or refinement of skills with emphasis on speed, and (4) the development of acceptable work behavior and work habits.
- c. Basis of the System - The WSD reflects three basic pre-vocational skills: (1) ability to discriminate between objects, (2) manipulation of a variety of small objects and (3) ability to apply basic concepts. While the WSD is mostly a training package for pre-vocational skills, it has limited use as a vocational evaluation system.

2. Organization

- a. Name and Number of Work Samples - The system consists of 20 samples arranged in three groups¹⁵:
 - (1) Discrimination Tasks - The following tasks, arranged in ascending order of difficulty, are used: (1) Three Item Sort, (2) Basic Size Discrimination, (3) Tactile Discrimination, (4) Cue Variable, (5) Subtle Color, (6) Subtle Size Sort, (7) Six Item Sort, (8) Rubber Parts Sort and (9) Twenty-Four Item Sort. These tasks were graded in order of difficulty by manipulating three variables: dimensional differences, subtlety of discrimination, and number of items.
 - (2) Assembly Tasks - Each of the following tasks has an acquisition and production phase: (1) Tube Assembly/Disassembly, (2) Paint Brush Assembly/Disassembly, (3) Coupling Assembly/Disassembly, (4) Container Packaging/Disassembly, (5) Connector Assembly/Disassembly, (6) Pen Assembly/Disassembly, and (7) Shelf Assembly/Disassembly.
 - (3) Packaging Tasks - The four Packaging Tasks have corresponding disassembly tasks: (1) Color Match Sequencing/Disassembly, (2) Snap Box Packaging/Disassembly, (3) Small Parts Packaging/Disassembly, and (4) Plate Weighing and Bagging/Plate Disassembly. "The Packaging tasks

¹⁵ Assembly/Disassembly and Package/Disassemble units are counted as one work sample.

require the discrimination and manipulation skills of other tasks, but also incorporate the application of basic concepts."

- b. **Grouping of Work Samples** - The work sample tasks are grouped in two different ways. The first, by function, is listed above. The second is by one of four difficulty levels:

Series One - Three Item Sort, Basic Size Sort, Tactile Sort, Tube Assembly/Disassembly, and Color Matching Sequencing.

Series Two - Cue Variable Sort, Subtle Color Sort, Paint Brush Assembly/Disassembly, Coupling Assembly/Disassembly, and Snap Box Packaging.

Series Three - Subtle Size Sort, Six Item Sort, Container Assembly/Disassembly, Connector Assembly/Disassembly, and Small Parts Packaging.

Series Four - Rubber Parts Sort, Twenty-Four Item Sort, Pen Assembly/Disassembly, Shelf Assembly/ Disassembly, and Weighing and Bagging.

- c. **Manual** - All directions are contained in a single, multi-colored, loose-leaf binder. The manual is organized by work sample type (i.e., discrimination, assembly and packaging). The following sections are given for each work sample: materials, procedure and quality criteria. There are illustrations showing the proper set-up for each task. The administration instructions are purposely vague; the trainer is to vary instructions according to the client's or student's needs. There is a generalized program plan giving guidelines for selecting tasks, selection of goals and reassessment. Some normative data is contained in the appendix.

3. Physical Aspects

- a. **Packaging of the Work Samples** - Each work sample is individually packaged and contained in one or more bins. No parts are shared between work samples.
- b. **Durability** - The task materials are made from durable metal, wood, plastic and rubber. Although WSD materials are not designed for shop or industrial use, they are durable for use within a classroom or evaluation laboratory.
- c. **Expendable Supplies** - Aside from forms and plastic bags for heat sealing, there are no expendable supplies.
- d. **Replacement** - Some replacement parts and supplies are provided in the initial package as extras. Other supplies can be ordered from the developer.
- e. **Computer Requirements** - Not applicable.

4. Vocational Evaluation Process

- a. **Preliminary Screening** - The manual contains no information on preliminary screening. Since the purpose of the WSD is to develop some very elementary skills, the system is useful as a preliminary screening method for training or additional assessment.

- b. Sequence of Work Sample Administration - The tasks are administered according to the four difficulty Series given in section 2.d. The client repeats each task until he/she meets the existing criteria, usually 90% for accuracy and predetermined MTM standard. He/she then progresses to the next task in the Series.
- c. Client Involvement - The manual contains no information about client involvement in the training process and no formal feedback procedures are given.
- d. Evaluation Setting - This is not specified. However, given the nature of the tasks, the WSD would fit into both a school classroom and a work activity center setting.
- e. Time to Complete the Entire System - Because the system emphasizes training to predetermined competency levels, this aspect is not relevant for the WSD. Thus, time to complete is dependent on the client's ability and the established performance levels.

5. Administration

- a. Procedures - All methods, procedures, illustrations are easy to understand.
- b. Method of Instruction Giving - The evaluator or teacher is urged to be flexible and modify instructions, offer examples, give additional cues and even change procedures according to individual needs. After the task has been selected and any modifications made in the procedures, the teacher selects one or more appropriate instructional methods. The ones briefly described in the manual are: hand-over-hand physical guidance, shaping, prompting, modeling, verbal instructions, verbal feedback, self-correction and visual feedback.
- c. Separation of Learning/Performance - The manual clearly divides the administration of all tasks into assessment and training. The training phase is, in turn, divided into acquisition and production. Each client/student must reach a 90% correct criteria before beginning production. Time and quality standards are only applied during the production phase. Thus, the WSD clearly differentiates between learning and performance.
- d. Providing Assistance to the Client - The evaluator or teacher is encouraged to provide as much assistance as is needed to teach the client the task. No mention is made of the type of assistance to be provided during the production phase.
- e. Repeating Work Samples - In the production phase the tasks are repeated for the purpose of reaching the exit criteria for each Series of tasks.

6. Scoring and Norms

- a. Timing - Exact procedures are not specified.
- b. Timing Interval - Not specified; the manual implies that timing begins after the acquisition phase is ended and stops when the last object has been sorted, assembled, disassembled or packaged.

- c. Time Norms - MTM norms are provided for the assembly/disassembly and the packaging tasks. There are no time norms for the discrimination tasks.
- d. Error Scoring - Each piece is checked against specific criteria for each task.
- e. Scoring Aides - No scoring aides are used.
- f. Quality Norms - There are no quality norms; a percentage of the errors is recorded. The manual mentions a 95% accuracy rating for the first three Series and a 98% accuracy rating for the fourth Series as being acceptable.
- g. Emphasis in Scoring - Both time and accuracy are equally important.

7. Observation of Clients

- a. Work Performance - The system contains a separate Work Performance Data Sheet. The following data are recorded for each task: working time, number of units, percent of norm, number of errors, percent of accuracy, baseline, training, goal and comments/observations.
- b. Work Behaviors - Work behaviors are primarily assessed as on-task or off-task. The following off-task behaviors are briefly defined: aggression, work station interferences, verbal aggression, inappropriate vocalizations, stereotypic behaviors, out-of-seat behaviors and playing and arranging of work materials. The Work Behavior Sheet also contains a space for behavioral analysis.
- c. Recording System - There are two recording methods for each Work Behavior Data Sheet (Apparently a separate sheet is used for each behavior): interval and event. In interval recording the client is observed at fifteen second intervals and the presence or absence of a behavior is recorded. Event recording is used for behavior that does not require continuous observation; here the behavior is recorded when it occurs during an observation period.
- d. Frequency of Observation - Each observation period has three, five minute sessions; each five minute session has 20, fifteen second intervals. "An observation period consists of three observation sessions, after which you can calculate and then note the average occurrence."

8. Reporting

- a. Forms - Results and behavior observations are recorded on the Work Behavior Sheet and the Work Performance Data Sheet, described above. The WSD also includes a Data Display form that permits the graphing of performance by time intervals.
- b. Final Report Format - A final report is not mentioned in the manual. However, the Data Display form could function in this capacity.

9. Utility

- a. Vocational Exploration -
- b. Vocational Recommendations-
- c. Counselor Utilization -

} According to the developers, the system is to be used as a "prevocational training and assessment program" to teach very basic skills in discrimination, assembly and packaging.

10. Training in the System

- a. Training Required - Training is required prior to use.
- b. Training Available - In-service training is provided by the developer when the system is installed.
- c. Duration - The session is one day in length.
- d. Follow-up - Training and follow-up are included in the price of the package.

11. Technical Considerations

- a. Norm Base - MTM norms are available on all assembly and packaging jobs. The manual gives both the per unit and per task 100% standard. There is a short discussion on how to calculate the client's percentage of industrial normal. These substitute for norms tables per se. No quality or error norms are available.
- b. Reliability - No studies are reported in the manual.
- c. Validity - No studies are reported in the manual.

12. Reviewer's Summary and Comments

The introduction of the Work Skill Development Package contains the following statement: "...The WSD Package is not a work evaluation system. It is not intended to evaluate or predict vocational readiness through a single administration of tasks." The system is a prevocational training program intended to be part of a skill and "behavior" acquisition process. Because of this the manual assumes that the tasks are administered several different times and for different purposes: The first administration is used to assess the client's ability to understand instructions and perform the task. Second, if the client does not master the task, the evaluator or teacher uses various instructional methods to teach the skills. The next step is commonly numerous practice sessions to reach a predetermined goal, such as 75% of industrial normal. Finally, the task can be administered as a sort of post-test.

The WSD's major purpose is as a training device for mentally retarded, severely physically disabled and/or mentally ill persons. The logical progression in complexity and working with different materials makes the system easy to use with moderately and severely mentally retarded persons.

The system's major problem centers around documentation. The manual should contain a more complete explanation of the uses on the system. Greater informa-

tion is needed on use of the system as an initial assessment device and as a training device. The manual lacks data on how to record, plot and use the results from repeated task administrations. Because these repeated trials are very important in basic skill training, they should be explained and some examples provided.

13. Address

Attainment Company
P.O. Box 103
Oregon, Wisconsin 53575

14. Cost

Current price is \$2,995.00. This includes shipping, delivery, either a personal or video in-service, and some replacement parts.

15. References

None presently available.

World of Work Inventory

(WOWI)

1. Development

- a. Sponsor - WOWI was developed by Dr. Robert E. Ripley and modified by Karen S. Hudson and Dr. Gregory P. M. Neidert of World of Work, Inc.
- b. Target Group - According to its manual, the system is designed for use with a wide range of persons: junior and senior high school students; community college and college students; adult education; private business and industry applicants and trainees; vocational rehabilitation clients; and prisoners. Although WOWI can be administered to many types of persons, the instrument requires an estimated eighth grade reading level.¹⁶
- c. Basis of the System - The group of tests, interest inventory, and temperament measure are all related to the fourth edition of the Dictionary of Occupational Titles and the Guide for Occupational Exploration. These two documents form the structure of the WOWI.

2. Organization

- a. Name and Number of Work Samples - The system is composed of a combination of either computer administered or paper-and-pencil tests and inventories. These are as follows:
 - (1) Identifying Information - demographical data and best liked school subjects are entered.
 - (2) Career Interest Activities - 238 items using a like-neutral-dislike scale measure interests in the following 17 Career Families: public service, science, engineering and related, business relations, managerial, the arts, clerical, sales, service, primary outdoor, processing, machine work, bench work, structural work, mechanical and electrical work, graphic arts and mining.
 - (3) Vocational Training Potentials - The following four alternative, multiple-choice, aptitude-ability tests are administered: Verbal (28 items), Numerical (14 items), Mechanical-Electrical (14 items), Spatial (14 items), Abstractions (14 items) and Clerical (14 items).
 - (4) Job Satisfaction Indicators - 180 items using a like-neutral-dislike scale measure temperaments in the following areas: Versatile, Repetitive, Performing Under Specific Instruction, Dominant, Gregarious, Isolative, Influencing, Self-Controlled, Valuable, Objective, Subjective and Rigorous. All of these are either directly or indirectly related to Temperaments as defined in the Handbook for Analyzing Jobs.

¹⁶ Two other versions of WOWI exist - An English version with a fifth grade reading level and a Spanish language version.

- b. **Grouping of Work Samples** - The tests are arranged in the order described immediately above. Each part of the system can be administered separately.
- c. **Manual** - The Interpretation Manual and Guide to Career Families contains general information on use and detailed information on the fairly complex interpretation process needed to convert test scores to the 17 Career Families listed above, and the relationship of the WOWI to other tests. Other administration information is located on the answer sheet. Although the manual contains no information on the administration of tests and scoring of the tests, such information is available from the publisher.

For computer administered tests, a separate introduction is given. It explains how to boot the disk and then refers the user to the respective computer manual for complete instructions. It also mentions how the client should return to an answer he/she would like to change.

A step-by-step interpretation cassette tape is available for test administrators.

3. Physical Aspects

- a. **Packaging of the Work Samples** - This section is not relevant for the WOWI.
- b. **Durability** - The test booklets are reusable.
- c. **Expendable Supplies** - If computer administration is used, printer paper is the only expendable supply. The test booklets require a separate answer sheet for each client. Work sheets for each of the 17 Career Families are also expendable.
- d. **Replacement** - When administering WOWI by computer, the disk is preset by the developer for a certain number of clients. After the number of clients are run, the disk can be returned to be "reset," or a new disk can be ordered.
- e. **Computer Requirements** - The software is contained on a single floppy disk. It requires an IBM-PC or IBM compatible computer with one disk drive and at least 128K RAM. The user must supply a DOS 2.0 or 2.1 disk to initialize the program. An 80 column serial or parallel printer is required.

4. Vocational Evaluation Process

- a. **Preliminary Screening** - Although not stated in the manual, the evaluator will have to make certain that the client can read at about the eighth grade level prior to administration.
- b. **Sequence of Work Sample Administration** - WOWI is administered in the sequence described in 2.b. above. While it is possible to vary administration when using the paper-and-pencil version, the computer version permits no variation.
- c. **Client Involvement** - The final results, called the Inventory Profile, is designed for both client and evaluator use. Following test administration, the client can be actively involved in translating the results into specific Career Families and DOT job titles. Although not stated in the manual, the Inven-

tory Profile and the sequent process could provide for close interaction between client and evaluator.

- d. Evaluation Setting - This is not specified in the manual; the instrument implies a formal testing situation. The test book and answer sheet may be sent home with the test taker if the administrator thinks it is appropriate.
- e. Time to Complete the Entire System - The WOWI tests and inventories are pure power tests, i.e., they are not timed. It is estimated by the reviewer that the WOWI could be given in between 45 minutes and an hour and a half. Interpretation would take longer.

5. Administration

- a. Procedures - No administration procedures are given in the manual.
- b. Method of Instruction Giving - Two separate methods are implied: (1) In computer administration, all instructions are given on the screen, (2) the test booklet can be self-administered or supervised by an evaluator. It must be noted that even when the computer version is used, many of the test items are still presented in the test booklet and NOT on the computer screen. This requires the client to be constantly moving his/her eyes between the booklet and the computer screen. The test booklet is used only on those sections which include diagrams or illustrations (i.e., 56 items).
- c. Separation of Learning/Performance - This is minimal; there are few or no practice exercises for the tests. Because the individual tests are very short, this is a very serious problem.
- d. Providing Assistance to the Client - No procedures are given in the manual.
- e. Repeating Work Samples - This is not relevant for WOWI.

6. Scoring and Norms

Because the WOWI is not a work sample system, the outline for this section does not apply. The WOWI is a computer scored test and the results are printed in a profile. If the test is computer administered, the computer immediately scores the test and prints the results. If the paper-and-pencil version of the test is administered, it is mailed to the developer for scoring and profiling.

7. Observation of Clients

There is no information in the manual about the observation of clients. Because administration is formal and the WOWI is completed in a relatively short time, opportunity for client observation is limited.

8. Reporting

- a. Forms - A separate answer sheet is used for paper-and-pencil administration.
- b. Final Report Format - There are two report formats. The locally scored computerized version results in an 80 column format report. The report format is well-designed and easy for both client and evaluator to read. The

contents are as follows: (1) demographic information, (2) A graph containing the score for each of the 17 Career Families is presented with their DOT occupational division. Each interest is presented on a scale from -60 to +60, with 0 as a neutral point. The percentage of dislike, neutral and like responses are given. A short verbal explanation is also printed. (3) The Vocational Training Potentials presents the scale scores in percentiles and T scores for each of the six ability tests. The scales are adjusted for the appropriate norm group. Verbal definitions of each aptitude are given. (4) The Job Satisfaction Indicators are presented in graphic format, ranging from -60 to +60, with 0 as a neutral point. The percentage of dislike, neutral and like responses are given. Each temperament is defined. (5) The final page is a summary, containing the two most liked GOE interest areas, two best liked school subjects, the two highest Career Families, the two highest aptitudes, and the two highest temperaments.

For users sending in the test results for scoring, a single page format containing the following information is used: (1) Career Interest Activities, (2) Demographic Data, (3) Job Satisfaction Indicators, (4) Vocational Training Potentials, and (5) Summary.

9. Utility

- a. Vocational Exploration - Although there is little direct experience to be gained by the client, the WOWI could serve as a first step of a vocational exploration program. The client uses the summary information in the summary report to locate specific DOT titles. However, no vocational exploration information is contained in the system per se.
- b. Vocational Recommendations - Recommendations are presented in the form of test results. Specific recommendations are not contained on the printout.
- c. Counselor Utilization - The system offers a well-balanced combination of interests, aptitudes and temperaments. In vocational evaluation, WOWI appears to have its primary utility as an initial screening device, to be followed by detailed occupational exploration, physical capacities assessment and a detailed measurement of other aptitudes and abilities.

10. Training in the System

- a. Training Required - No information available; assume none.
- b. Training Available - A cassette training tape is available. Occasional scoring and interpretive information is sent to users in mailings. On-site training is also available for a fee.
- c. Duration - No information available.
- d. Follow-up - No information available.

11. Technical Considerations

- a. Norm Base - Due to central scoring procedures, normative data are collected on an ongoing basis. This results in a constant updating of norms. Printed normative data for the aptitude tests are available on the following popula-

tions: business, junior college, public high school, private high school, male prisoners, technical school, vocational counseling and vocational rehabilitation clients. Within each group, norms are presented for several levels of education and age groupings. Sample sizes within each of these groups range from five to several hundred. Unfortunately, there is no available information on the selection of the normative groups.

- b. Reliability - Reliability is presented in terms of alpha coefficients, Spearman-Brown split-half and standard errors of measurement. Individual scale alphas range from .24 to .94; most of these are in the .80's. Over 90% of these are significant at the .001 level.
- c. Validity - The only validity information presented in the manual listed correlations between Career Family and the Job Satisfactory scores and the following Strong-Campbell Interest Inventory scales: General Occupational Themes, Basic Interest Scales, and Occupational Scales. Correlations between the Kuder DD Occupational Interest Occupational Scales and College Scales, Edwards Personal Preference Schedule scores, 16 Personal Factors Test, Taylor-Johnson Temperament Analysis Profile Scores, and Study of Values and the WOWI were also presented. Because no information is provided on samples and testing conditions, these data are hard to interpret. The manual contains no information on predictive and concurrent validity.

12. Reviewer's Summary and Comments

The WOWI is designed to provide an assessment of three major considerations in vocational planning and hiring: interests, aptitudes and temperaments. The WOWI combines these three variables types into one system; it then uses the results as the beginning of a vocational planning process. Perhaps the most unique feature of the WOWI is the specific measurement of the temperaments as defined in the Handbook for Analyzing Jobs. Although temperaments are widely used in vocational planning and in computerized job matching systems (Botterbusch, 1986), the reviewer knows of no specific tests or instruments that have been developed other than this section of the WOWI.

The WOWI can be used as a screening device in the very beginning of the vocational evaluation process. The WOWI would provide a quick first measure of basic aptitudes, interests and temperaments.

The WOWI does have several problems: First, there is a lack of administration and scoring instructions in the manual. Second, even with the computer administration the test items for some sections are taken from the printed test booklet. It should be pointed out, however, that the items not presented on the screen are only those containing diagrams, charts and illustrations. Third, the aptitude tests are very short, many containing only 14 items. Fourth, because these tests are pure power tests, they increase in difficulty very rapidly. It would be interesting to have the item analysis data for these scales. Fifth, the reported validity is limited to correlations with other interest and personality tests.

In summary, in vocational evaluation the WOWI has use as a screening measure early in the evaluation process. The most unique feature is the direct measurement of DOT related temperaments.

13. Address

World of Work, Inc
2923 N. 67th Place
Scottsdale, AZ 85251

14. Cost

World of Work Inventory Test Booklet (reusable):

1 to 5	\$2.00 each
6 to 24	\$1.50 each
25 to 49	\$1.25 each
over 50.	\$1.00 each

WOWI Answer Sheets (includes scoring):

1 to 4	\$4.25 each
5 to 24	\$3.50 each
25 to 99	\$3.00 each
100 to 400	\$2.50 each

WOWI Floppy Disk

10 test administrations (plus 1 test booklet)	\$34.00
25 test administrations (plus 1 test booklet)	\$73.50
50 test administrations (plus 1 test booklet)	\$146.00

Manuals and Related:

<u>Interpretation Manual and Guide to Career Families</u>	\$14.95
<u>Mini Manual</u>	\$2.75
<u>Using the DOT for Job Placement</u>	\$22.50
<u>Occupations in Demand 1985 - 2000</u>	\$25.00

Other Materials

Occupational Exploration Worksheets set of 17	\$1.50
Packages of 50 Worksheets.	\$3.50
Specimen Set: Inventory Booklet, 1 answer sheet, Interpretation manual and Guide to Career Families.	\$19.95
Instructional Cassette Tape	\$10.00

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Glossary of Vocational Evaluation Terms

Aptitudes - The specific capacity or ability required of a person in order to facilitate the learning of a job or task. Job analysis using the U.S. Department of Labor method collects data on 11 aptitudes: G - General Learning Ability; V - Verbal; N - Numerical; S - Spatial Perception; P - Form Perception; Q - Clerical Perception; K - Motor Coordination; F - Finger Dexterity; M - Manual Dexterity; E - Eye-Hand-Foot Coordination; and C - Color Discrimination. The first nine of these are commonly measured by the General Aptitude Test Battery.

Assessment - The " 'process of finding out what the strengths and limitations of an individual are in terms of optional functional outcome and developing proposals for alternate service plans.' Assessment is to rehabilitation services what diagnosis is to medicine. While vocational assessment uses many of the same techniques and methods as vocational evaluation, assessment is a more one-way process where clients' vocational strengths and weaknesses are determined by an evaluator or teacher. Because it deals with the basics of client capabilities, physical limitations, vocational relevant aptitudes and functional literacy, assessment is more limited in scope than evaluation. Assessment usually has little concern for vocational exploration, interests and attitudes and tends to confine itself of the immediate skills available" (Botterbusch, 1983, p. 8).

Career - "The sequence of occupations, jobs, [and] positions throughout a person's working life. The sequence of events in the life of a person as he [sic] in a job or as he [sic] changes from one job to another in the occupational structure" (VEWAA, 1983, p. 2).

Cluster Trait Sample - "A work sample that assesses a number of traits inherent in a group of related jobs. Based upon an analyses of occupational grouping and the traits necessary for successful performance, it is intended to assess the client's potential to perform jobs that have a common set of performance requirements" (VEWAA, 1983, p. 2).

Bi-Polar Interests - See Interests.

Data-People-Things (DPT) - The middle three digits of the DOT Code, indicates the complexity of a job in relation to three separate hierarchies of Data, People and Things.

Disadvantaged - A person constrained by reason of youth, advanced age, low educational attainment, ethnic or racial factors, prison or delinquency records, or any other condition, especially in association with poverty.

Environmental Conditions - The physical surroundings of the job that make specific demands on the worker's physical capacity. The Handbook for Analyzing Jobs includes the following factors: work location (i.e., inside, outside or both); extreme cold; extreme heat; wet and/or humid; noise and/or vibration; hazards and atmospheric conditions.

Functional Limitations - Restrictions of physical or mental functions that hinder a person's ability to take care of his/her own affairs.

General Educational Development (GED) - Those aspects of both formal and informal education contributing to the worker's Reasoning, Mathematical, and Language skills. These are considered the basic skills needed to some degree in all jobs. Reasoning and Mathematical are divided in six areas; language into five.

Guide to Occupational Exploration Codes (GOE) - See Interests.

Industrial Standards - "Actual worker requirements from industry based on the expectations of the employer in terms of quality, quantity, and work behaviors" (VEWAA, 1983, p. 6).

Interests - Interests are a liking or preference for an activity. There are two methods for classifying interests in the DOL job analysis methodology. The first is using the codes given in the Guide to Occupational Exploration; the 12 general classifications are: Artistic, Scientific, Plants and Animals, Protective, Mechanical, Industrial, Business Detail, Selling, Accommodating, Humanitarian, Leading-Influencing, and Physical Performing. The second method is to use the bi-polar interest factors; if one of the pair is selected the other, by definition, cannot be chosen. There are five pairs of factors: things and objects vs. communication of data; business contact with people vs. scientific and technical activities; routine, concrete, organized activities vs. abstract and creative activities; presumed good of people vs. tangible production.

Job Analysis - The systematic study of a position in terms of what the worker does, how he/she does it, and what the outcomes are. Although there are numerous methods of job analysis, the most commonly used in vocational evaluation are the procedures developed by the U.S. Department of Labor. (DOT, 1972; DOL, 1983)

Job Clusters - "Related occupations grouped on the basis of similar job requirements, such as specific duties of the job, materials and equipment used, skill and knowledge, and worker characteristics required" (VEWAA, 1983, p. 6).

Job Exploration - "A process whereby an individual is exposed to work experience and occupational information intended to increase his [sic] knowledge of the world of work" (VEWAA, 1983, p. 7).

Job Site Evaluation - "An evaluation technique where the client performs the actual job duties in a real work situation. Performance is supervised and evaluated by the employer in coordination with evaluation staff" (VEWAA, 1983, p. 8).

Job Task - See Task.

Occupational Groups Arrangement (OGA) - The first three numbers of the DOT code. These are three levels of grouping of jobs from general to specific. All jobs in the DOT are grouped into nine major Categories, 82 two digit Divisions, and 559 three digit Groups.

Physical Demands - These are the physical requirements made of the worker by the specific job-worker situation. There are two separate classification systems for physical demands (i.e., A Handbook for Analyzing Jobs and A Guide to Job Analysis). The Handbook includes six separate factors: Strength (sedentary, light, medium, heavy and very heavy); climbing and/or balancing; stooping, kneeling, crouching, and/or crawling; reaching, handling, fingering, and/or feeling; talking and/or hearing; and seeing. In some job matching and work sample systems, strength is sometimes treated

as a separate variable. Physical demands are also called "Physical Limitations." The Guide contains 285 separate physical demands.

Prevocational Evaluation - "An assessment process conducted prior to work or training to determine if an individual has the ability to develop and to maintain work skills and related work behaviors. The term, which originated in education and occupational therapy, is used primarily with individuals having little or no work history (i.e., students)" (VEWAA, 1983, p. 8).

Single Trait Work Samples - "Assesses a single trait or characteristic. It may have relevance to a specific job or many jobs, but it is intended to assess a single, isolated factor" (VEWAA, 1983, p. 10). In form and structure a single trait work sample is very similar to a standardized performance test.

Situational Assessment - "A systematic observation process for evaluating work-related behaviors in a controlled work environment..." (VEWAA, 1983, p. 10). Most situational assessment is conducted in sheltered employment settings.

Specific Vocational Preparation (SVP) - The amount of time required to learn the techniques, acquire information and develop the facility needed for average performance in a specific job-worker situation. This training may be acquired in a school, work, military, institutional, or a vocational environment. There are nine levels of SVP, ranging from a "short demonstration only" to "over 10 years."

Strength - See Physical Demands.

Task - "A grouping of the elements and work activities of a job that have a common purpose, and are closely related in terms of methodologies, materials, products, services and types and sequences of worker actions. (DOL, 1982, p. 6).

Temperaments - The adaptability requirements made on the worker by specific types of jobs. Like physical demands and environmental conditions, there are two slightly different lists of temperaments. The following temperaments are from the Handbook for Analyzing Jobs: interpretation of feelings; influencing people; making evaluations on sensory or judgmental criteria; responsibility for direction; making decisions on measurable criteria; dealing with people; repetitive; performing under stress; precise attainment of set limits; and variety of duties.

Vocational Counseling - "Process of assisting a person to understand vocational liabilities and assets, and providing occupational information to assist them in choosing an occupation suitable to their interests and liabilities" (VEWAA, 1983, p. 12).

Vocational Evaluation - "A comprehensive process that systematically utilizes work, either real or simulated, as the focal point for assessment and vocational exploration, the purpose of which is to assist individuals in vocational development. Vocational evaluation incorporates medical, psychological, social, vocational educational, cultural, and economic data into the process to attain the goals of evaluation" (VEWAA, 1983, p. 12).

Vocational Exploration - See Job Exploration.

Work Behaviors - "Those aspects of behavior in a work setting that enable a person to meet the demands of his [sic] job in accordance with employment standards. This includes such areas as: attendance, punctuality, hygiene, social behavior, team work,

cooperation, ability to accept constructive criticism, ability to accept supervision, effort..." (VEWAA, 1983, p. 13).

Work Sample - "A well defined work activity involving tasks, materials and tools which are identical or similar to those in an actual job or cluster of jobs. It is used to assess an individual's vocational aptitude, worker characteristics, and vocational interests" (VEWAA, 1983, p. 14).

Worker Trait Profile - The combination of the values assigned to all or some of the following variables: GED, SVP, aptitudes, physical demands, bi-polar interests, GOE interests, environmental conditions or temperaments.